

JULY 1982

July 1: Thomas Utsman, director of technical support for the Kennedy Space Center, has been named director of launch and landing operations for the Space Shuttle, succeeding George Page, who has been named deputy director of KSC. Utsman, 44, has worked at KSC since 1963, serving as associate director of design engineering and operations management and deputy director of technical support. (DEFENSE DAILY, 7-1-82, p. 7, Vol. 123, No. 1)

<> NASA's John F. Kennedy Space Center has awarded a joint venture contract to KAMAG Transporttechnik GmbH and Co. of Ulm/Donau, West Germany and Precision Fabricating and Cleaning, Inc. of Sharpes, Florida, to provide transporter units for Space Shuttle launch preparations.

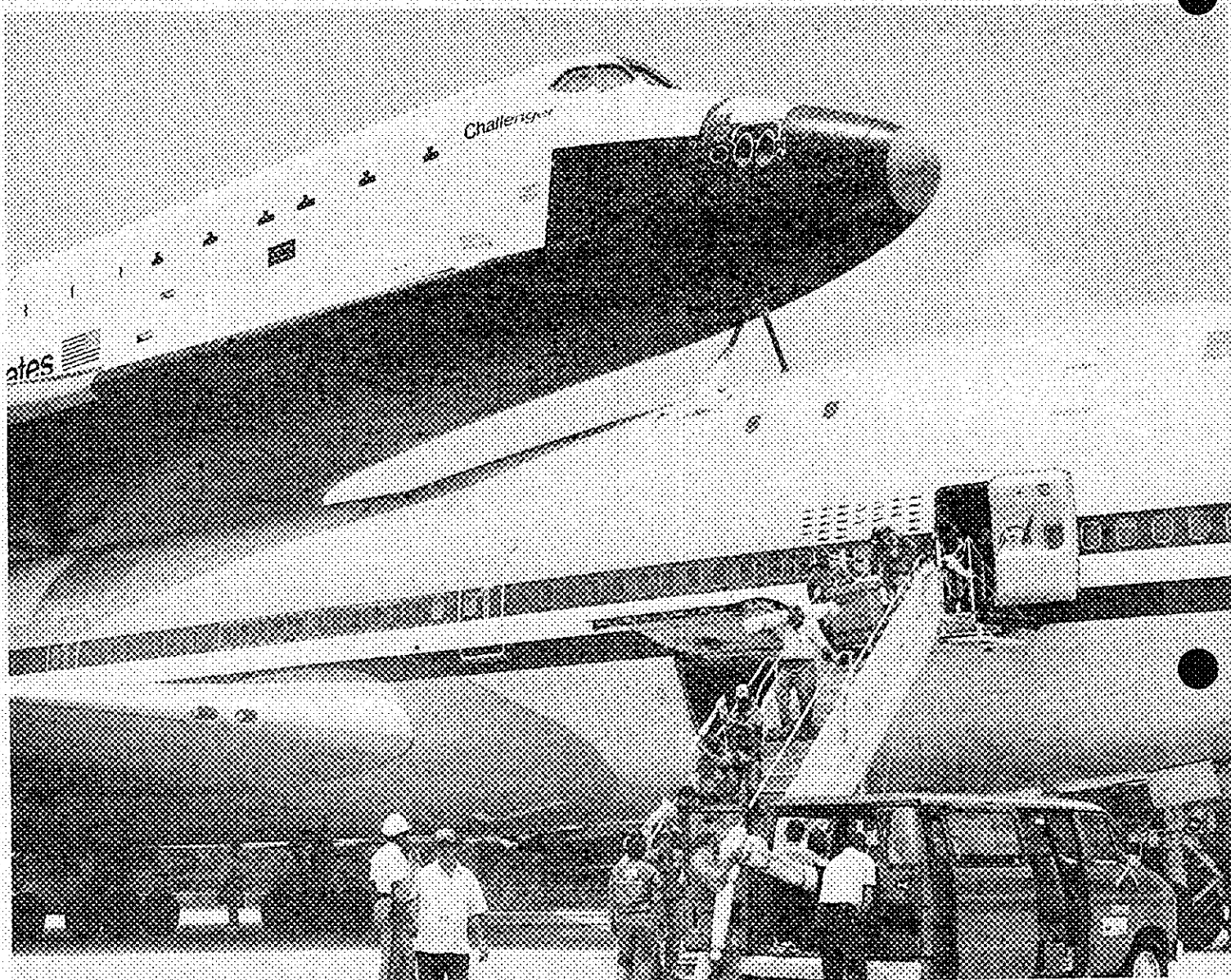
The contract has a basic value of \$2,883,548 and is for the construction, testing and delivery of two self-propelled transporter systems in support of Space Shuttle operations at KSC and Vandenberg Air Force Base, California. An option for a third such transporter may also be exercised. (KSC RELEASE NO. 164-82, 7-1-82)

<> With a Marine Corps band playing the theme from "Star Trek," America's new, improved-model Space Shuttle was delivered to NASA Wednesday in ceremonies outside the Rockwell International assembly hangar.

Paul J. Weitz, who will command Challenger on its maiden flight next January, accepted a symbolic key to the Shuttle's hatch on behalf of "all us taxpayers who are footing the bill for this magnificent flying machine."

George Jeffs, president of Rockwell's North American Space Operations, congratulated more than 1,000 employees for meeting the delivery schedule set 2 1/2 years ago and referred to the veteran Columbia orbiting high overhead.

"That baby was built out here, too," he said.



"Shortly after NASA's newest space-going orbiter, Challenger, arrived at KSC atop a 747 carrier aircraft, Rockwell technicians unload the special handling tools required to demate it from the 747."

"This means we now have a fleet of Space Shuttles," said Rep. William Thomas, R-Calif. "As small as it is right now, it is going to grow."

Weitz said Columbia's current flight, last of four test missions, means "basically we are getting down to the business of operating these things in space."

Challenger, mounted atop a modified jumbo jet, is to be flown next week from Edwards Air Force Base to Kennedy Space Center where NASA will add its big engines and ready it for space flight.

Though it looks identical to Columbia, this new Shuttle is a bit different. Rockwell says the most important change is that Challenger is certified "operational" -- the ship and its on-board systems are supposed to make at least 100 flights before requiring a major overhaul.

Columbia's systems, considered development models, are not certified for 100 missions. But, NASA says, once Challenger is on the job early next year, the veteran spaceship will be taken out of service and its systems upgraded. (TODAY, 7-1-82, p. 16A)

July 4: One of Space Shuttle Columbia's rocket boosters was photographed by a U.S. Navy television camera Saturday on the bottom of the Atlantic Ocean and found to be pretty much intact.

The report set NASA officials to thinking about recovering some of the booster's components, such as data recorders, electronics assemblies and parachutes.

The giant chutes on the boosters failed to deploy after the spent rockets were jettisoned during Columbia's launch last Sunday. The rockets, instead of floating as they were supposed to, plummeted 3,500 feet to the bottom.

NASA said the Navy has "two systems with light salvage capability" -- one in Baltimore, the other in San Diego -- and that one will be brought in for better inspection and possible salvage.

The television camera used Saturday was aboard an underwater sled. (TODAY, 7-4-82, p. 16A)

July 5: More than 1 million telephone calls were made to a special number allowing Americans to listen in on live conversations between the Columbia space shuttle and Mission Control, American Telephone & Telegraph Co. said Sunday.

The company logged 1,025,295 calls during the weeklong space flight, said Carolyn Zachary, spokeswoman for AT&T's Long Lines division. She said 8,000 of the calls were made in the last nine minutes of the flight Sunday. (THE MIAMI HERALD, 7-5-82)

<> Following are excerpts from the text of the White House fact sheet on national space policy issued Sunday:

The president announced today a national space policy that will set the direction of U.S. efforts in space for the next decade....The president's directive reaffirms the national commitment to the exploration and use of space in support of our national well-being, and establishes the basic goals of United States space policy which are to:

- * strengthen the security of the United States;
- * maintain United States space leadership;
- * obtain economic and scientific benefits through the exploitation of space;
- * expand United States private sector investment and involvement in civil, space and space-related activities;
- * ...cooperate with other nations in maintaining a freedom of space for activities which enhance the security and welfare of mankind.

The principles underlying the conduct of the United States space program, as outlined in the directive are:

- * The United States is committed to the exploration and use of space by all nations for peaceful purposes and for the benefit of mankind....

* The United States space program will be comprised of two separate, distinct and strongly interacting programs -- national security and civil....

* The United States Space Transportation System (the Shuttle Program) is the primary space launch system for both national security and civil government missions.

*The United States will pursue activities in space in support of its right to self-defense...

...The directive establishes the following policies governing the development and operation of the Space Transportation System:

* The STS is a vital element of the United States space program, and is the primary space launch system for both the United States national security and civil government missions....

* The United States is fully committed to maintaining world leadership in space transportation with an STS capacity sufficient to meet appropriate national needs.

* The STS program requires sustained commitments by each affected department or agency. The United States will continue to develop the STS through NASA, in cooperation with the Department of Defense....

* For the near term, the STS will continue to be managed and operated in an institutional arrangement consistent with current NASA-DOD Memoranda of Understanding. Responsibility will remain in NASA for operational control of the STS for civil missions and in the DOD for operational control of the STS for national security missions....

...In accordance with the provisions of the National Aeronautics and Space Act, the directive states that the civil space program shall be conducted:

* To expand knowledge of the Earth, its environment, the solar system and the universe;

* To develop and promote selected civil applications of space technology;

* ...To further United States domestic and foreign policy objectives....

The directive states the following policies which shall govern the conduct of the national security program:

- * Survivability and endurance of space systems, including all system elements, will be pursued commensurate with the planned use in crisis and conflict, with the threat, and with the availability of other assets to perform the mission....

- * The United States will proceed with development of an anti-satellite (ASAT) capability, with operational deployment as a goal. The primary purposes of a United States ASAT capability are to deter threats to space systems and the United States and its allies and, within such limits imposed by international law, to deny any adversary the use of space-based systems that provide support to hostile military forces.

- * The United States will develop and maintain an integrated attack warning, notification, verification, and contingency reaction capability which can effectively detect and react to threats to United States space systems..... (TODAY, 7-5-82)

<> President Reagan pledged support for the space program in his Fourth of July address, but made no firm commitment to building a manned space station or a fifth shuttle orbiter as NASA had hoped.

In a speech filled with references to the Old West, Reagan said the shuttle proved Americans still have the "know-how" and "true grit" to tame the savage wilderness.

His words echoed across the bleak Mojave Desert of California, where the aerospace industry has bloomed into an industry of billions of dollars. As governor of the state, Reagan was largely responsible for funding a space shuttle task force in 1971 to win the main shuttle contract for California.

The task force succeeded. In July 1972, exactly 10 years ago, Rockwell International got the \$2.3 billion main contract for the shuttle.

The Mojave is still Reagan country. And if his Independence Day speech didn't spell happy trails for NASA, at least it didn't sound like Death Valley days either.

"I see it as a strong statement of support for what we are doing," said Lt. Gen. James A. Abrahamson, NASA associate administrator for space transportation systems. "He supported us -- that's the key."

With the dummy space shuttle Enterprise behind him as a prop, Reagan said the country must "never forget the benefits we receive are due to our country's commitment, made a decade ago, to remain the world leader in space technology."

"We must look aggressively to the future by demonstrating the potential of the shuttle and establishing a more permanent presence in space," Reagan said in his only reference to a space station. (THE ORLANDO SENTINEL, 7-5-82, p. A-1)

- <> Launch of the space shuttle on its final development mission June 27 within milliseconds of a target liftoff scheduled more than three months earlier has given program officials confidence to move into the operational phase that will carry the burden of U.S. military, commercial and scientific space activities for the next 20 years or more.

The first operational shuttle launch, Mission 5, is scheduled for November 11. Two commercial communications satellites will be carried into a 160-mile orbit by the shuttle orbiter and then propelled into a geosynchronous orbit by a solid spinning upper stage. The payloads are Satellite Business Systems C and Telesat of Canada Anik D satellites.

The 90-hour Mission 4 launch countdown, plus 24-hour hold time, gave National Aeronautics and Space Administration, Defense Department and aerospace contractors an opportunity to test what they hope will be a standard set of countdown tasks. Differences will be dictated by payload servicing requirements and by the number of astronauts in the crew. Mission 5 will be the first to carry a crew of four. (AVIATION WEEK & SPACE TECHNOLOGY, 7-5-82, p. 19, Vol. 117, No. 1)

- <> Martin Marietta's external tank used to fuel the space shuttle's main engines with cryogenic propellants for Mission 4 landed as predicted in the Indian Ocean. Based on

data at the time of separation from the orbiter Columbia, splashdown point was 83.07 East Longitude, 28.41 South Latitude.

The empty tank weighed 75,895 pounds, 107 pounds more than the Mission 3 tank. The added weight came from more instrumentation.

The impact point data indicate that the tumble valve functioned properly. Confirmation that the tank tumbled will come from motion pictures taken by the orbiter. Film will be processed when it is removed from Columbia after landing. (AVIATION WEEK & SPACE TECHNOLOGY, 7-5-82, p. 19, Vol. 117, No. 1)

- <> National Aeronautics and Space Administration and the U.S. Air Force placed numerous personnel at Dakar, Senegal, to support trans-Atlantic abort modes for the fourth shuttle launch.

Yoff Airport, Dakar, unlike Rota, Spain, which was used during previous missions did not have a permanent U.S. presence. This required sending substantial personnel to West Africa.

The bulk of the personnel was from Kennedy Space Center, which is responsible for recovery of orbiter vehicles at all landing locations.

Kennedy sent at least 14 personnel to Yoff. This included five Wackenhut Corporation employees to coordinate crash and rescue operations and to help save the orbiter in the event of a successful emergency landing.

Four Rockwell International personnel also were sent to help remove the crew and tow the vehicle to a remote site at the airport.

Five NASA Kennedy personnel headed by ground operations manager William Lockwood were at Dakar and in charge of safety, security and logistics during the launch. A Kennedy design engineer was present taking core samples of taxiways and potential parking sites to insure the load-bearing capabilities of those areas would support the orbiter.

At least three Johnson Space Center personnel, including astronaut Ron Walker, were at Dakar to assist the orbiter crew in their final approach to Yoff Airport in the event an emergency landing became necessary.

Air Force support included a McDonnell Douglas C-9 medical evacuation aircraft and crew plus a mobile Tacan crew. (AVIATION WEEK & SPACE TECHNOLOGY, 7-5-82, p. 18, Vol. 117, No. 1)

July 6: It's a leaner, cleaner flying machine than its predecessor. But the Shuttle Challenger, which arrived at the sweltering Kennedy Space Center Monday /July 5/ morning on the spine of a Boeing 747, is so far unchallenged by the rigors of Earth orbit.

Almost 1000 space center workers and their families made themselves comfortable with lawn chairs and picnic coolers near the 3-mile-long Shuttle runway when the Challenger-747 duo made a graceful but dusty touchdown at 11:48 a.m.

Shuttle veteran Columbia will return to the space center from Edwards Air Force Base, California, July 16. Space center director Dick Smith predicted its next flight, scheduled for November 11, could be pushed ahead as much as three weeks. "I want to beat it a few weeks. We'll be ready," he said.

The new, improved 1983 model Shuttle will make its flying debut when the Challenger roars from Kennedy Space Center in January. (TODAY, 7-6-82, p. 1A)

<> NASA's Kennedy Space Center is issuing RFP's for an eight-month study to provide an overall analysis of ground operations and deployable spacecraft processing associated with the modules and other elements of modular, incrementally-deployed manned, low-Earth-orbit Space Station.

NASA is hoping to start constructing the Station in about three or four years and have it in space by 1990.

The study will use experience gained from previous space programs to determine approaches to Space Station ground processing and operations, including identification of new and innovative methods.

Specifically, the study is to determine optimum methods of testing, checkout, integration, servicing, troubleshooting, logistics support, quality control, safety, data analysis and problem reporting and tracking.

The study will also estimate manpower, equipment facilities and costs involved in carrying out the ground operations tasks. (DEFENSE DAILY, 7-6-82, p. 12, Vol. 123, No. 2)

July 7: Pan American World Airways Inc., Cocoa Beach, has been awarded a \$1.33 million NASA contract extension for services at Kennedy Space Center and Canaveral Air Force Station. The extension began July 1 and ends October 31 and brings the cumulative contract total to \$14 million.

Pan American has provided medical and environmental services for the space center and Air Force station for the past five years. (TODAY, 7-7-82, p. 12C)

<> This past weekend was a star-spangled extravaganza for the U.S. space program. In rapid-fire sequence as the cameras rolled, the Columbia completed its fourth successful mission, the new Shuttle, Challenger, embarked on its journey to Kennedy Space Center and President Reagan outlined his administration's policy on space. Of the three the last event was least impressive.

The space policy is fine, as far as it goes, but it doesn't go far enough....

"The STS is a vital element of the United States space program, and is the primary space launch system for both United States national security and civil government missions..." the policy states. But without leadership from the White House and a commitment toward specific goals, the program could be further victimized by budget-cutters in Congress who are busily looking for sacrificial lambs.

The administration's apparent indecisiveness on space also is showing up in other ways. Private investors interested in financing a Shuttle are said to be reluctant to put up any money until they are assured they can have a relatively free hand in operating the vehicle for business purposes. That seems to be a reasonable request, yet the White House seems uncertain about whether to go along with such a plan.

An interagency group headed by National Security Adviser William Clark is studying specific space projects and will make recommendations to Reagan about funding priorities. Let us hope those recommendations, and the president's subsequent decisions, reflect the support the space program must have if the United States is to retain its superiority in that field. (TODAY, editorial, 7-7-82, p. 8A)

July 8: Engineers worked Wednesday to remove a tail cone from the Space Shuttle Challenger for shipment to California and installation on the Shuttle Columbia, which needs it for a cross-country trip next week.

The tail cone, which fits over the spacecraft's main engine pods to improve its aerodynamics during shipping, will be dismantled and flown to Edwards Air Force Base by the end of the week, Kennedy Space Center spokesman Dick Young said.

It was installed on Challenger for its flight from California on Sunday and Monday bolted atop a modified Boeing 747 jetliner.

Columbia, which completed its fourth and final test mission Sunday, also will be returned to Kennedy flying piggyback on the ferry plane.

Challenger's first orbital flight is scheduled for January. Work on Challenger will continue as Columbia is prepared for its fifth mission, set for November. After that, Columbia will be taken out of service temporarily for refurbishment.

Young said Columbia was drained of fuel and propellants Wednesday in preparation for its trip to Kennedy. It is scheduled to leave California on July 15 on the overnight return trip to its launch site. (TODAY, 7-8-82, p. 14A)

July 9: Kennedy Space Center Director Richard G. Smith has announced the appointment of Robert G. Long to serve as KSC's director of center support operations.

Long succeeds William M. Lohse, who is retiring effective today after 40 years of distinguished federal service.

Long, who has served as Lohse's deputy since May, 1980, began his federal career with the U.S. Army's Corps of Engineers at Charlotte, N.C., in January, 1955. He joined NASA at what is now the Kennedy Space Center in June, 1962, and served in a number of major managerial positions during the Apollo and Skylab program era and the build-up for the Space Shuttle program that followed.

He was appointed director of administrative operations and support services in January, 1976, remaining in that capacity until he became deputy director of center support operations in May, 1980.

Long was born in Charlotte, N.C., and attended public schools there. He was graduated from Virginia Military Institute with a bachelor of science degree in civil engineering in 1952, and served for two years as an engineering officer in the U.S. Air Force.

Long and his wife, Natalie, live on South Merritt Island.
(KSC RELEASE NO. 171-82, 7-9-82)

<> Federal officials investigating safety conditions as the Shuttle launch pad announced Friday /July 9/ they found the facility met Occupational Safety and Health Administration standards but some space center firefighters say they are not happy with the decision.

It was complaints by five firefighters of exposure to poisonous Shuttle fuel fumes in mid-June that prompted a more than 10-day investigation of pad 39A at Kennedy Space Center, OSHA officials said.

"No citations will be issued. We investigated the complaints and there were no violations of OSHA standards," said Howard Stephens, supervisor for industrial hygiene at OSHA's Tampa office. And he said a spill of some of that

same chemical on June 29 was not a result of any below-standard procedure or equipment at the pad. Stephens would not comment on the case beyond that.

While the government was calling the case closed, some firefighters said they were disappointed with the OSHA findings. Gerald Driskell, a firefighter and official of the Transport Workers Union, called for greater launch pad safety procedures.

"OSHA and NASA are on the pad only when they have to be there. The firefighters and security people have to be there continuously," he said.

As the Shuttle becomes an operational space vehicle and it is on the launch pad with greater frequency the presence of toxic fuels will be more routine but safety precautions cannot be lax, firefighters said.

Driskell recommended a continual, round-the-clock chemical "sniff test" to detect fumes while firefighters maintain a 24-hour presence on the pad.

"It's like an old water pipe--it can work fine for 10 years but you don't know when it's going to bust," said Driskell, referring to machinery that contains the toxic fuels.

But NASA officials said Friday as the Shuttle becomes operational, it would be too great an expense to have a constant monitoring. (TODAY, 7-10-82, p. 1A)

<> Twenty years ago today, the Telstar satellite linked Europe and North America via television and triggered a communications revolution that would shrink the entire globe.

It's still up there, long silent after its 1962 launch from Cape Canaveral Air Force Station, but a whirling monument to the birth of what is now grandly called the Information Age.

Designed and built by the American Telephone & Telegraph Co. and its Bell Laboratories, Telstar was the world's first true "active" satellite, able to receive, amplify and retransmit radio signals in space.

"It is a noteworthy anniversary because if we sit back and look at what's happened to domestic and international communication in the last two decades....it's really been quite extraordinary," says AT&T spokesman Pic Wagner.

"I was 10 years old and living in London and my father made us gather around the TV set," recalled Jonathan Miller, now the managing editor of the Washington-based publications Satellite Week and Communications Daily. "I remember the BBC portentously counting down, 5-4-3-2-1, and then nothing happened. The British ground station was aimed at the wrong spot and they missed the signal.

"So we sat and sat and waited for the satellite to come back around again, and suddenly we saw a picture of the American flag flying in the wind," he added. "It was really quite amazing. There was a sense of simultaneous participation on both sides of the Atlantic."

By today's standards, of course, Telstar can only be called primitive. Weighing just 170 pounds with a diameter of 34 1/2 inches, the satellite could handle only a few telephone calls or one television transmission at a time. And it worked for only 226 days before its electronics fell prey to high-altitude radiation.

The satellite also had to be boosted into a highly elliptical orbit, looping around the Earth at a high point of 3,531 miles and a low of 592 miles. Telstar was thus accessible to ground antennas in Europe and the United States for only short periods of time during each orbit.

Telstar was launched at 3:35 a.m. on July 10, 1962, aboard a Delta rocket and the first telephone conversation occurred at 7:23 p.m. between then-Vice President Lyndon B. Johnson in Washington and Frederick R. Kappel, AT&T's chairman, who was at Andover, Maine, where AT&T had built its satellite transmitting antenna. (TODAY, 7-10-82, p. 10A)

July 13: Later this week, a two-armed, deep-sea robot will probe the wreckage of the Space Shuttle's rocket boosters which sank in the Atlantic minutes after Columbia's fourth launch last month, NASA officials said Monday.

The AT&T-built robot will search for the boosters' tape recorders which NASA officials hope will help explain what went wrong after the two rockets peeled away from the Shuttle two minutes after liftoff and splashed down 150 miles east of Kennedy Space Center.

The \$36 million booster casings, which are reusable, are supposed to float. On Columbia's first three missions they worked properly, but on the fourth launch, they sank in 3,100 feet of water. Space agency officials have said Columbia, scheduled to fly its fifth mission in late October or early November, won't be launched again until they determine why the canisters sank.

The robot is scheduled to sail from Baltimore today aboard a NASA booster recovery ship and will arrive here Thursday or Friday.

Armed with claw-like pincers, underwater television cameras, sonar and a metal cutter, the remote-control robot will try to retrieve tape recorders located inside the boosters. The tape recorders are similar to the crash-proof "black boxes" carried aboard commercial airliners to record cockpit conversations.

"They record the sequence of events and if the right signals got through the pyrotechnics that command stages to separate and the parachutes to open," NASA spokesman Mark Hess said.

NASA has said the parachutes that slow the boosters descent apparently failed to open properly, but investigators are trying to pinpoint the exact cause of the malfunction.

The robot, called Scarab, for Submersible Craft Assisting Repair and Burial, is the size of a compact car and can probe depths of up to a mile. The robot will be controlled by technicians aboard the UTC Freedom, one of the Shuttle's two booster recovery ships.

It is not anticipated that the boosters will be recovered. At least one is broken up in large pieces. (TODAY, 7-13-82, p. 10-A)

July 14: A study to determine the best methods for setting up a central management complex to direct Space Shuttle operations at Vandenberg AFB is being conducted by Boeing Services International for the Air Force Space Division. The central management complex will be built within the Shuttle launch and recovery facilities at Vandenberg. Under a \$235,000 contract awarded by Kennedy Space Center and to be completed by the end of next month, Boeing will:

1) Recommend integrated management structures to coordinate the various management styles of contractors and government agencies and determine the appropriate flow of information between the parties.

2) Recommend facility layouts, computer equipment and information systems; identify which parts of the complex should be automated and which should be manual, and design the layout of management rooms where charts depicting program status will be displayed. (DEFENSE DAILY, 7-14-82, p. 61, Vol. 123, No. 8)

July 15: "The most recent NASA estimate for operational turnaround time (achievable by STS-30, the 30th flight) is 51 days for processing an Orbiter from landing to launch. This represents an increase of 20 days from the previous estimate, based on a post STS-1 reassessment. The current 51-day turnaround and processing procedures at KSC (Kennedy Space Center) will allow only 14 flights per year. Current SRB (Solid Rocket Boosters) stacking operations used by KSC in turnaround appear to be a primary limiting factor. The 14 flights per year is less than the planned flights per year for FY '86 and subsequent years" -- NASA Office of Inspector General Audit Report, May 27, 1982. (DEFENSE DAILY, 7-15-82, p. 71, Vol. 123, No. 9)

<> Landing moments before a cooling thundershower, the Space Shuttle Columbia returned to Kennedy Space Center Thursday morning and NASA engineers said they plan to remove the spacecraft's secret defense department cargo Sunday.

Columbia, slightly scorched from a fourth mission in space, made the 2,000 mile journey across the United States attached to the top of a Boeing 747 in two days.

The 1,053-mile jaunt ended with a routine landing on the KSC runway at 10:33 a.m.

Columbia will make this piggy-back ride from the Shuttle landing site at Edwards Air Force Base, California, only one more time -- following the end of the fifth mission in late October or November. After that, subsequent flights of Columbia will launch and then land at KSC's 3-mile-long runway.

The combo was towed to the steel crane that unhooks the spaceship from the 747 following the landing. Columbia was scheduled to be moved to its hangar by early this morning, said Herman "Fritz" Widick, Orbiter processing manager.

Widick said the hangar, which now houses Columbia's sister Shuttle Challenger, will be cleared of all personnel except most entrusted to remove the Shuttle's secret Air Force cargo. Publications close to the aerospace industry have speculated the instruments include an infrared camera designed for early warning missile detection.

The instruments and their tape recorders of data will be shipped to defense department labs for analysis.

With Columbia's arrival, KSC engineers have two manned spacecraft being processed here at the same time -- the first time that has happened since the Skylab program in the early 1970s.

Challenger, scheduled to make its first space voyage in January, arrived at KSC from its California manufacturer July 5.

Widick also expressed confidence Columbia can be launched for its first satellite-carrying, operational flight before the planned November 11 date. "October 29 is very achievable, although it is still only a target date," he said.

Columbia will carry a crew of four and two satellites into orbit on its next flight. After that, it will be temporarily retired for a major overhaul while Challenger steps in. (TODAY, 7-16-82, p. 16A)

<> NASA's John F. Kennedy Space Center has awarded Boeing Services International, Inc., Kennedy Space Center, Florida,

a supplemental agreement valued at \$46,833,660 to an existing contract. The award provides for Boeing to perform Ground Support Operations services for a sixth contract year at the Space Center.

The contract modification covers a one-year period from July 1, 1982, to July 30, 1983. This agreement brings the total value of the cost plus fixed fee contract to \$308,932,101. (KSC RELEASE NO. 175-82, 7-16-82)

<> NASA's John F. Kennedy Space Center has awarded Boeing Services International Inc. of Kennedy Space Center, Florida, a one-year, \$11,752,020 extension of its contract to provide supply and transportation services to KSC.

This extension will mark the fifth consecutive year that Boeing has provided such services to KSC. The basic contract went into effect in July, 1978. The services include shipping, repair, supply and distribution of manufactured items. The extension brings the cumulative contract value to \$53,228,250. (KSC RELEASE NO. 172-82, 7-16-82)

July 17: An anniversary cake for 1,800 people was devoured in 90 minutes Friday /July 16/ as thousands gathered to remember the first moon landing 13 years ago and to have a peek at the future.

Former astronauts and space center alumni assembled in the visitors center auditorium Friday morning to tell hundreds of tourists what they remembered about July 16, 1969, and to emphasize its importance.

"The landing on the moon and return will probably be considered the greatest events to happen in this century," said Bob Murkshe, co-chairman of the Apollo 11 Commemoration Association.

"As time goes by things tend to get a little fuzzy. We formed the committee...to make sure people did not forget." (THE ORLANDO SENTINEL, 7-17-82, pp. C-1 & C-7)

July 18: The space shuttle Columbia will make its first commercial trip into space on November 11, after all. It seems that while the shuttle and its cargo will be ready to go in October, NASA's paying customers won't be.

Last Tuesday /July 13/, the space agency announced that it had shaved 13 days from the "turnaround" time between flight four and flight five and that the next launch would be October 29.

That apparently surprised Satellite Business Systems of McLean, Virginia, and Telesat Canada, Inc., who are shipping two communications satellites aboard the shuttle to be placed into space.

A NASA source said the firms told the space agency that their work on the ground, such as getting receiving equipment ready, was predicated on the November 11 target date.

So NASA, on Friday /July 16/, announced that as the new launch target date.

The satellites, in the cargo bay, will be expelled by spring-like devices at an altitude of about 172 miles.

Columbia then moves a short distance away and a rocket called a solid spinning upper stage will ignite to boost the satellites to a "parking" orbit 22,300 miles above Earth. At that height, a satellite rotates in step with Earth and thus remains over the same spot all the time. (THE MIAMI HERALD, 7-18-82)

<> * Now that space flights are routine, they will be used to solve those scientific mysteries which for centuries have plagued mankind. First, let's find out if its easier to remove the first olive from the jar at zero gravity.

* Also, is there dandruff in space or does it just float away?

* Then, let us discover whether or not a game of billiards in space must be played with tennis rackets.

* After which, we can probe the unknown for the answer to the question -- is there a place in orbit where you can go out for a good time on a Saturday night without spending an arm and a leg?

* NASA has been talking about using the Space Shuttle for fancy experiments with chemicals and metallurgy, but I think people are more interested in developing a non-gravity peanut butter that won't stick to the roof of your spaceship. (TODAY, "MARK RUSSELL", 7-18-82, p. 15A)

July 19: The Air Force is studying a miniature version of the space shuttle that would launch from the top of a jumbo jet.

The spacecraft, called an air launched sortie vehicle, resembles the rocket ship in the James Bond movie MOONRAKER. It is designed to fly unmanned but could be modified for manned missions, according to a report by the Boeing Aerospace Co.

The minishuttle could begin flying as early as 1988, Boeing predicted.

Military payloads already make up the bulk of the shuttle's future missions. But unlike the shuttle, Boeing's smaller version could take off from virtually any large airport in the world on a few minutes notice.

On a typical flight, the minishuttle would ride to about 37,000 feet atop a Boeing 747 jetliner. With the carrier plane pointing in a 60-degree flight angle, the spaceship would fire nine small rocket engines to reach orbit.

Once in space it could act as a tanker, delivering a small cargo. It also would be ideal for spying missions, able to fly over any point on earth on short notice. (THE ORLANDO SENTINEL, 7-19-82)

July 20: Because of bad weather and a balky camera, officials failed Monday to photograph the two rocket boosters that sank in the Atlantic during the fourth space shuttle launch.

A NASA spokesman said strong currents and trouble with the video camera of a special deep-sea robot device forced two special recovery ships to return to the Cape.

After installing a new cable, the ships will leave port later this week to make another try at photographing the casings in 3,500 feet of water, 160 miles east of the spaceport.

Officials are trying to learn why the rockets did not hit the ocean and float after peeling away from the shuttle orbiter Columbia 2 minutes after blastoff on June 27. Officials agree that parachutes failed to open, but they do not know why. (THE ORLANDO SENTINEL, 7-20-82, p. B-6)

July 23: Cal Burch has been appointed Chief of the Launch Operations and Physical Security Branch. He is succeeding G.E. Morford, who retired.

Burch will manage the electronic security, communications security and physical security systems. Physical Security includes guards, grounds, badges, alarms, payload and VIP protection.

A 1967 graduate of Auburn University, Burch began his federal career in 1968 as a military police officer in Viet Nam. He worked in the Division of Security of the Atomic Energy Commission and assisted the security inspector for the Department of Energy.

Having just completed his first month with KSC, Burch says he enjoys the operational end of security and is looking forward to working with all elements of KSC. (SPACEPORT NEWS, 7-23-82, p. 6, Vol. 21, No. 15)

<> A group of Kennedy Space Center contractors and government employees are being awarded \$100 for discovering new technological items as a result of a contract with NASA.

The winners and their inventions are as follows: William J. Steinway, Marietta, Georgia, with the Georgia Institute of Technology, is responsible for developing a high

resolution soil layer depth measurement. Frank E. Winner, Merritt Island, of Martin Marietta developed an explosion proof electronic position indicator.

Charles A. Gillespie, Titusville, with Rockwell International invented a tool that would seal a vent door without damage. James E. Myers, Rockledge, also with Rockwell, invented a waterproofing tool.

Robert W. Johnson, Gainesville, of USDA Soil Conservation Service, together with Robert A. Glaccum, Miami, with Technos, Inc. and Ronald J. Wojtasinski, Cocoa Beach, representing NASA, came up with a soil sensing technique using radar. This would allow scientists to monitor changes in the earth and test the soil for building, sanitation and agriculture purposes.

Feng-Nan Lin, William L. Moore and Floyd E. Lundy, Jr. all from Titusville, and representing NASA, designed a butterfly valve that regulates the flow of water for the sound suppression water system. That system absorbs vibration and sound by remote control during space launches.

To be eligible for an award, the new technology must be under contract and in connection with the space program and be approved for publication in "NASA Tech Briefs". The awards are provided as part of the NASA awards system. (SPACEPORT NEWS, 7-23-82, p. 3, Vol. 21, No. 15)

<> "The Kennedy Space Center's excellent performance in processing and launching the Space Shuttle has been recognized again on the highest levels," noted KSC Director Dick Smith as he released congratulatory messages on the STS-4 mission from NASA Administrator James M. Beggs ...

Said Beggs in a telex to the KSC Director:

"In his remarks on the landing of the Space Shuttle Columbia, President Reagan stated that '...now we will move forward to capitalize on the tremendous potential offered by the ultimate frontier of space.'

"Clearly, the President's remarks reflected his confidence in our ability to do the job -- a confidence that has been

built and fostered by NASA's proven excellence on Mercury, on Apollo, and more recently, on the Space Shuttle. They have been great successes.

"However, the credit for these successes belongs to every member of the NASA team. All of you have continued to demonstrate the same selfless dedication to total performance that has characterized NASA since its inception.

"It would be impossible for me to give everyone at Kennedy Space Center the individual recognition that is so highly deserved. Nevertheless, I would be most appreciative if you might convey to every member of the KSC team -- both our civil service personnel and our contractors -- my thanks and appreciation for a job very well done."

Noted Smith: "The attention of the world is focused on what we do here and how well we do it. Once again, all of you have come through magnificently. And I'd like to add my personal thanks to those of Administrator Beggs and Deputy Administrator Mark." (SPACEPORT NEWS, 7-23-82, p. 1, Vol. 21, No. 15)

July 24: America's first astronaut baby was born Monday to astronauts Dr. Rhea Seddon Gibson and Robert "Hoot" Gibson.

The baby boy developed a slight breathing problem and was transferred to a Houston hospital, a space agency spokesman said.

Paul Seddon Gibson, weighing seven pounds, two ounces, was born at 4:10 a.m. at Clear Lake Hospital near the Johnson Space Center. Mrs. Gibson became the first of eight female astronauts to give birth.

The infant began having difficulty breathing about 4 p.m. and was flown by helicopter to Hermann Hospital's neo-natal care unit, about 20 miles away, said Steve Nesbitt of NASA.

"There's no real serious threat," Nesbitt said. "The hospital in Clear Lake really doesn't have the kind of facilities to handle cases that need more than the normal attention." (TODAY, 7-24-82)

<> Eskimo igloos in the Arctic regions of Canada will be warmed by that black box called television thanks to a satellite that will circle the globe at 22,000 miles up.

Anik D, scheduled to launch aboard a Delta rocket from Cape Canaveral Air Force Station August 19, will bring television to some of the most remote parts of western and Arctic Canada, said William Zatychec, director of TELESAT Canada's satellite division.

"Some people don't want to live up there unless they have communications with South Canada," he said.

With 24 transmitter/receivers, Anik D will have the capability to transmit television, telephone and data to subscribers throughout the country. Each transmitter/receiver can accommodate one television program or about 500 telephone calls.

Zatychec said the \$30 million satellite will orbit the Earth over western Canada near Winnipeg and should be operational about six weeks after launch.

"Essentially, Anik D will more than double satellite communications in Canada," Zatychec said.

Anik D will join four other Aniks already in space and one following will have the distinction of being one of the first satellites to be launched aboard the Space Shuttle's fifth mission in November.

The 2,500-pound satellite will be launched between 7:22 and 9:43 p.m., August 19.

Anik, which means "little brother" in Eskimo, originally was set to launch August 12. But delays in launching the LANDSAT satellite at Vandenberg Air Force Base, California, July 16, were responsible for postponing the Anik launch.
(TODAY, 7-24-82)

July 28: Four Kennedy Space Center security guards were hospitalized early Tuesday after they were exposed to poisonous fumes at the Space Shuttle launch pad, NASA officials said.

All were released from Jess Parrish Memorial Hospital in Titusville by noon, 11 hours after they were admitted at 1 a.m., hospital officials said.

"They are in excellent condition," said Chris Healy, the hospital's assistant director of nursing services.

The guards were held for observation after they complained of sore throats and headaches, Healy said.

The incident brings to three the number of toxic fuel leaks at the pad since early June.

The guards, all employees of Wackenhut Services, Inc., were Joseph Varanay, 58, of Rockledge; Kathleen Carroll, 30, of Cocoa; Susan Barton, 26, of Titusville; and Kent Banks, 25, of Merritt Island.

They are expected to return to duty today or Thursday.
(TODAY, 7-28-82, p. 1A)

July 29: After landing on desert runways on its first four flights, the Space Shuttle Columbia will probably return next time to the concrete strip near its Kennedy Space Center launch pad, a senior NASA official said Wednesday.

Deputy Administrator Hans Mark, appearing before a congressional committee with the astronauts who returned from space earlier this month, said also that the \$36 million loss of the Shuttle's two rocket boosters may have been caused by two miscalibrated sensors.

A landing at Kennedy Space Center on Flight Five has been a on-again, off-again proposition. Officials had hoped first to get some experience landing in the kind of crosswinds that blow across KSC's 15,000 foot runway.

But the crosswinds weren't there on the previous flights -- three on the desert floor, one on a concrete runway on the desert -- and Mark said the Kennedy landing "probably" would be attempted without the cross wind experience.

"There is a debate, but most of us think we ought to go to Kennedy," he said. The previous "official" word had been that a KSC landing would not be attempted until the seventh flight, next year.

Mark appeared with Flight Four astronauts Thomas K. Mattingly, Jr., and Henry Hartsfield before the House Science and Technology Committee. Columbia's next trip into space is scheduled for November 11-15.

The spent rockets that boosted the Shuttle on its way to orbit plunged to the bottom of the Atlantic, instead of being lowered by giant parachutes to be recovered by waiting ships as planned.

The 150-foot long boosters have three main parachutes, each attached by lines, called risers, at two points. To facilitate the boosters' recovery, the risers are supposed to be cut by two explosive charges when the booster hits the water -- each charge cutting three alternate lines. The explosives are triggered by a sensor that reacts to shock.

Mark said the sensors are calibrated to ignore the shock of the chutes opening. On the last flight, he said deployment of the 115-foot diameter parachutes apparently triggered one sensor on each booster, cutting half the risers and preventing the chutes from opening. (TODAY, 7-29-82)

July 30: The House by voice vote has adopted a resolution congratulating NASA, the astronauts and the contractor and subcontractor team for the successful completion of the Space Shuttle flight test program and the entry of the U.S. "into a promising new era of space flight..." The Senate passed an identical resolution last week. (DEFENSE DAILY, 7-30-82, p. 158, Vol. 123, No. 20)

AUGUST 1982

August 2: A remote-controlled submarine operated by Lanham-based East Port International has located and photographed one of the two space shuttle booster rockets that sank 100 miles off the Florida coast after the June 27 launch.

The tiny submarine, named Scarab 2, began searching for the two \$24 million boosters two weeks ago. It carries no crew and is operated from a surface ship.

Roy Ewing, manager for technical services at East Port, declined to disclose when the submarine first located the booster rocket. But he confirmed that film and videotape of the 150-foot-long, 80-ton booster have been sent to the National Aeronautics and Space Administration at Marshall Space Flight Center in Huntsville, Alabama, for review by scientists.

"We've shot a lot of hours of film and of videotape," Ewing said. Several cameras are mounted on the submarine's all-aluminum housing, in addition to two claw-like contraptions that can grasp and manipulate objects on the ocean floor.

Ewing said the submarine is now looking for the second booster.

A NASA investigations board at Marshall will examine the rocket booster pictures to determine what, if any, action to take next, NASA representative Lyn Cywanowicz said.

Cywanowicz said that nothing else has been done with the boosters so far and that nothing has been brought to the surface.

East Port's Ewing said the search-and-survey project NASA contracted the firm to undertake has been running a little behind schedule because of minor delays.

Some repairs have been made on Scarab because of problems with debris it encountered in the 3,500 feet of water where the boosters sank, he said. (THE WASHINGTON POST, 8-2-82)

August 3: More than 10,000 space center employees have been told they could be laid off next month if Congress doesn't grant a \$31 million budget request to pad the NASA payroll until the end of the fiscal year.

But NASA aides in Washington and U.S. Rep. Bill Nelson of Melbourne agreed Monday that the budget bill probably will pass easily, and that the chance of employee "furloughs" for up to 10 days, as proposed, is slim.

Space center employees received notice last week of potential layoffs because a federal law requires that they be warned a month in advance of any layoff of less than 30 days, /Mary Kerwin/ said. (THE ORLANDO SENTINEL, 8-3-82, p. B1)

August 5: Retiring Johnson Space Center director Christopher C. Kraft Jr. said Wednesday the Reagan administration should spend more money for space research instead of bombers and missiles.

Kraft, who played a key role in the U.S. manned space program and in development of the Space Shuttle, made the comment at a farewell news conference.

"I don't understand how this country can spend \$222 billion in the next 3 1/2 to 4 years on the B-1 bomber and the MX missile and not be willing to spend another half-billion dollars per year on the space program," he said.

Kraft, 58, will leave the space agency on Saturday. He announced earlier this year he intended to retire in November and the earlier departure came as a surprise.

"It's time for a new leader," he explained....

Kraft said the major challenge for the new director, Gerald D. Griffin, will be to refine the uses of the Space Shuttle and to promote the development of the manned space station.

Griffin is the former deputy director of the Kennedy Space Center.... (TODAY, 8-5-82, p. 1)

<> NASA made it official Thursday -- the space agency will accept bids from aerospace companies for a multimillion dollar contract to operate the Shuttle program at Kennedy Space Center.

The space agency will accept proposals from as many as eight firms by November and NASA administrator James Beggs is expected to select a contractor in mid-1983.

Since November 1981, firms such as United Airlines and Grumman Aerospace have had teams of engineers observing Shuttle launch preparations.

Under the Shuttle Processing Contract, one company would be selected for overall launch preparations and Shuttle maintenance -- consolidating the work of several smaller contractors.

Presently Rockwell International is the major Shuttle contractor and it too must compete for the new contract.

Beggs' announcement Thursday confirmed that NASA is committed to a Shuttle Processing Contract, said Dick Young, KSC spokesman.

"The Shuttle processing philosophy was formally adopted. It will greatly increase effectiveness and reduce costs," he said. (TODAY, 8-6-82, p. 16A)

August 6: NASA's John F. Kennedy Space Center has awarded General Cable Company, Fiber Optics Division of Edison, New Jersey, and Pearl, Mississippi, a contract to install fiber optic communication cable at the Kennedy Space Center.

Work under the fixed-price contract valued at \$734,107 began June 28, 1982, and is due to be complete by January 27, 1983. (NASA NEWS RELEASE NO. 178-82, 8-6-82)

<> NASA's Kennedy Space Center, Florida, has selected Computer Sciences Corporation, Falls Church, Virginia, for final negotiations leading to award of \$9,372,000 firm, fixed-price contract for a Space Shuttle Inventory Management System (SIMS) II.

SIMS II will assist NASA in ensuring that spare parts, supplies and materials are available as needed to support the Shuttle program. The contract will call for delivery of automatic data processing equipment; communications equipment; computer software; data requirements; training for terminal users, computer operators and system controllers; and software creation and maintenance personnel.

The system will be used to control the location and movement of material to support Shuttle material needs at the Kennedy Space Center, including spare parts for the Shuttle and cargo ground support equipment, flight hardware and other projects within the Center's responsibility. It will also be used to provide management of institutional support requirements.

Similar work under the contract will also be performed at Vandenberg Air Force Base, California.

Also bidding on the contract were: Northrup Services, Inc., Winter Park, Florida; Pan American World Services, Inc., Cocoa Beach, Florida; and Martin Marietta Data Systems, Englewood, Colorado. (NASA NEWS RELEASE NO. 82-120, 8-6-82)

- <> NASA's John F. Kennedy Space Center has awarded Industrial Steel, Inc. of Mims, Florida, a contract to manufacture test equipment for the Space Transportation System.

Industrial Steel will procure adapters and test fixtures to proof-test the Space Transportation System lifting and handling equipment. This equipment will be used to handle STS flight hardware, including Space Shuttle Orbiters and their subsystems, such as the payload bay doors and the reaction controls system.

This firm-fixed-price contract valued at \$50,348 began July 28 and will end February 1, 1983. (NASA NEWS RELEASE NO. 187-82, 8-6-82)

- <> William M. Lohse, KSC Director of Center Support Operation, has retired after 40 years of distinguished federal service.

Lohse served as Director, Procurement Supply and Transportation for three years at KSC before being appointed Director of Center Support in 1980.

As Director of Center Support Operations his responsibilities were to provide general support services (base support functions) for all KSC and tenant organizations on the John F. Kennedy Space Center.

Before retiring from the U.S. Navy as a Captain in 1965, Lohse had a widely varied career in supply and procurement with the Navy.

When asked the highpoints of his NASA career, he came right to the point:

"Apollo--terrific and shuttle contruction--outstanding!" He added, "But above all...the great people I had a chance to work with."

Lohse expressed his sincere thanks to everyone for the "...nice (retirement) coffee and outstanding party."

He said his immediate plans include, "Playing golf and getting the house in order."

He and his wife Gertrude reside in Cocoa. (SPACEPORT NEWS, 8-6-82, p. 4, Vol. 21, No. 16)

<> The man who will oversee the launch of the next Space Shuttle said despite reports to the contrary, the Shuttle won't land at Kennedy Space Center earlier than the seventh flight in April 1983.

Thomas E. Utsman, KSC's newly appointed Shuttle launch director, also predicted the Columbia's fifth mission will begin as planned on November 11 as preparations for the first satellite deployment continue without a snag.

The 45-year-old Utsman said in an interview Friday that more tests of the Shuttle's computerized automatic landing system are needed in the wide expanse of the California desert at

Edwards Air Force Base before astronauts attempt to maneuver on the 15,000-foot-long, 300-foot-wide concrete runway at Kennedy. (TODAY, 8-7-82, p. 1A)

<> A NASA investigation team has decided to salvage parts of the space shuttle's sunken solid rocket boosters from the bottom of the Atlantic Ocean, but the job will be ticklish, space center spokesmen said Friday.

One of the boosters was shattered, but a 40-foot section of the second remained intact when booster parachutes failed to open and the casings hit the water during Columbia's fourth launch June 27.

The recovery effort will begin as soon as the team develops a salvage plan for securing and lifting the booster pieces, which are resting in about 3,500 feet of water about 150 miles off Cape Canaveral.

"We really don't have a feel for how long that means, but it will be as soon as possible," said KSC spokesman Ed Harrison. The pieces are expected to be difficult to lift. (THE ORLANDO SENTINEL, 8-7-82)

August 7: William H. Young, longtime Orlando resident and father of astronaut John Young, died Saturday after a long battle with cancer.

Born one year before the Wright brothers' flight at Kitty Hawk, the 80-year-old engineer saw his son log five trips to space, walk on the moon, and command the first voyage of the space shuttle.

The elder Young is survived by his wife, Ruth; sons John W. Young, of Houston; Hugh H. Young, of Fukuoka, Japan, stepson, James W. Mosteller of San Diego; stepdaughter, Mrs. Mary M. Stuckey, Independence, Kansas; brother Heyward Young of Lewiston, N. Y.; sister, Mrs. Sarah Y. Hebble of Cartersville; and eight grandchildren. (THE ORLANDO SENTINEL, 8-9-82, p. A-9)

August 9: The space agency is laying the groundwork for a permanent orbiting space station and the NASA administrator said construction could begin in 1985 and be finished in the early 1990s.

James Beggs said the Reagan administration still has to be convinced there is a need for such an orbital base, but he said he is optimistic that approval eventually will be received from the White House and Congress.

The National Aeronautics and Space Administration chief also said there is still a possibility that the space shuttle Columbia will land at the Kennedy Space Center at Cape Canaveral, Florida, on its next mission in November even though the plan now is to land at Edwards Air Force Base, California. (THE ORLANDO SENTINEL, 8-9-82, p. A-7)

<> The health of the Kennedy Space Center's first launch operations director has rebounded since last year, when he suffered a near-fatal reaction to kidney dialysis equipment.

Kurt Debus, who directed the launch of 282 rockets at KSC from 1953 until his retirement in 1974, spends most of his time now at his Cocoa Beach home. While retaining an avid interest in man's space exploration efforts, the 74-year-old electrical engineer no longer is involved in KSC operations.

"1981 was a difficult year," said Gay Debus, his wife. "They tried to put a dialysis device in his abdomen so he could hook up to the machine easier, but it caused very bad internal bleeding."

After a nine-day hospital stay in the intensive care unit, he has shown continual improvement.

...Invitations to speak before scientific conventions in Europe and America continue to arrive. However, he has been unable to accept the offers, she said....

Debus' retirement in 1974 came as a surprise to many. He was 66 years old.

"There are younger men, a younger generation. We must give them a chance," he said at the time.

Debus did not, in any way, look upon his retirement as a sad event: "We have begun to develop the sets of tools to solve our worldwide problems," he said. "I have lived through the most interesting of times. The world has seen a period of 30-40 years which provided nearly all of our technical knowledge....No period in the past holds any great interest for me -- I can dream about the future. I have a good idea what's going to happen." (TODAY, 8-9-82)

<> Except for the 1963 mission of cosmonaut Valentina Tereshkova, "manned spaceflight" has meant just that: for nearly 20 years the stratosphere has been an all-male preserve. Now the Soviet Union is preparing to put a second woman in orbit when it launches Soyuz T-7 later this month. Marina Savitska is the woman most likely to blast off. Two men will accompany her on the mission, which will follow the pattern of Soyuz T-6. That one had another kind of mixed crew: two Soviets and a Frenchman. (NEWSWEEK, 8-9-82)

August 10: Electrospace Systems, Inc., of Richardson, Texas, has won a \$1,600,000 contract to provide computer-controlled data switching equipment for use in the firing rooms of the Space Shuttle Launch Control Center.

Under the fixed price contract, the company will design, fabricate, test and deliver four Remote Controlled Video Switch Subsystems for use in the Space Shuttle's Launch Control Center. The subsystem is a computer controlled switching matrix which allows an operator to connect as many as 100 data channels to as many as 80 recording and display units. The new switching matrices will allow KSC to process multiple Space Shuttle orbiters using firing rooms simultaneously.

Electrospace Systems, Inc., a small business firm, will perform the work at its plant location in Texas in a period of 12 months and three weeks from the contract date. (KSC RELEASE NO. 188-82, 8-10-82)

<> It will cost at least \$266 million to fly each of the five space shuttle missions planned for 1983 -- seven times the amount NASA plans to charge its customers.

The total price tag for the shuttle program is now expected to top \$21 billion, including \$18 billion spent by NASA and \$3.6 billion invested by the Department of Defense, space officials have told Congress.

The space agency will suffer a huge financial loss on early shuttle flights, and may end up losing billions of dollars during the program's first years of operation, according to a report by the General Accounting Office.

NASA charges customers about \$38 million to rent the shuttle's entire cargo bay -- less than one-seventh the true cost. The Columbia is scheduled to carry its first satellite cargo in November, during its fifth trip to space.

But it will be 1989 at the earliest before NASA recovers the full flight cost from shuttle users, NASA officials say.

NASA will pay 80 percent of shuttle flight costs during the next three years, while flying only about 36 percent of the shuttle missions, the GAO estimated. That represents a \$2.2 billion subsidy -- in 1982 dollars -- to other users, the agency reported.

The space agency is trying to recoup some of that money by increasing the launch fees paid by the military, which has booked nearly half of the scheduled missions. (THE ORLANDO SENTINEL, 8-10-82, p. B-1)

August 12: Installation of experiments on the Spacelab 1 pallet was completed last week with the attachment of the European Space Agency (ESA) Bridge - a platform supporting 12 European experiments.

"With installation of the bridge, we have completed physical integration of all Spacelab 1 scientific experiments," said Harry Craft, Spacelab 1 mission manager of NASA's Marshall Space Flight Center, Huntsville, Alabama. "We are proceeding smoothly toward beginning power-up of the experiments in late August. Following power up, we will begin a functional checkout of each experiment...."

Integration and checkout of Spacelab 1 experiments and preparations of the laboratory for flight aboard the Space Shuttle is being accomplished at the NASA's Kennedy Space Center in Florida. An ESA resident team at Kennedy is participating in these activities.

Marshall Space Flight Center is the lead NASA Center for Spacelab, and is also responsible for overall management of the first three Spacelab flights, and for monitoring development activities in Europe.

Spacelab 1 is a joint ESA/NASA mission, scheduled for launch aboard the Space Shuttle in September 1983. (NASA NEWS RELEASE NO. 190-82, 8-12-82)

<> The Space Shuttle Columbia and the two satellites it will carry into orbit should make their November 11 date in space, but the Shuttle Challenger may not get off the ground in time in January, engineers said Thursday.

A delay of several days in the delivery of Shuttle main engines to Kennedy Space Center could hold up the Challenger's maiden flight, now set for January 20, said James Harrington, chief of Orbiter operations.

"I have no feel for when the main engines will get here," he said, adding that the slowness in some testing procedures also might hold up the spacecraft's first flight. "I don't know if it can fly in January but we're going to try," said Harrington, who gave reporters a guided tour of the Shuttle hangar Thursday morning.

Officials of Rockwell International, the prime Shuttle contractor, said they were optimistic the Challenger would be ready for launch on time and predicted engines would be at the space center in plenty of time for installation in the spacecraft.

Right beside the Challenger in the hangar is Columbia -- a proven veteran of space flight. By September 10, technicians will have completed the repairs and modifications needed for the fifth mission. Only Columbia's toilet will get a late reinstallation while the Shuttle is on the launch pad in October. Harrington said the toilet's

slinger, designed to pulverize and sterilize waste matter, did not work up to par during the last mission and was returned to its manufacturer for repairs.

The two communications satellites that will be deployed into space aboard the Columbia also will be installed three weeks before launch, while the spacecraft is on the pad.

One satellite, operated by TELESAT of Canada, will serve educational television and pay television customers in southern Canada, the most populous region of the country. The other, owned by Satellite Business Systems, will serve American businesses relaying data across the country. Engineers with both satellite companies said they chose the Shuttle because it is far cheaper than the rockets previously used to send their cargo into space.

"This is a good buy," said Michael Lyons, satellite business systems mission manager, in comparing the \$23 million rocket launch price with the \$9 million Shuttle price. The satellite themselves are valued at about \$22 million each.

Only 8 1/2 hours after launch, the Satellite Business Systems satellite will be ejected from the Columbia's 60-foot-long cargo bay on springs at a speed of 3 feet per second. The Canadian satellite will follow 24 hours later.

Both will reach their final destination 22,000 miles up four days later as they ride on a rocket engine called the Payload Assist Module or PAM. (TODAY, 8-13-82, p. 16A)

August 13: The space shuttle Columbia is expected to be processed in record time for its fifth flight, and its first two paying customers are putting final touches on the satellite cargo.

Processing for the November 11 launch should take no more than 40 days, about a week less than it took for the last mission, a NASA official said Thursday/August 12/.

After processing, the orbiter is scheduled to be taken to the Vehicle Assembly Building September 10, and to the pad later next month, said Jim Harrington, chief of orbiter operations. (THE ORLANDO SENTINEL, 8-13-82, p. B-1)

August 14: Astronaut Sally Ride, set to become the first American woman to fly into space, and astronaut Steve Hawley were married last month in Salina, Kansas, the couple told friends this week. (TODAY, 8-14-82, p. 14A)

August 16: West German scientists Monday/August 16/ unveiled a "getaway special" experiment to be flown on America's space shuttle in November.

The experiment, in a special canister aboard Columbia, will consist of an attempt to take x-rays of a gallium-and-mercury metallic chemical mix as it is heated to a molten state and then allowed to cool.

Scientists hope to track the gallium into mercury and then back out.

The material weighs less than one gram.

Dr. Guenther Otto of the Institute for Space Simulation in Koeln, West Germany, classified the experiment as "pure research." Although it has no immediate practical value, the experiment may lead to future breakthroughs in the field of materials processing in space, he said.

The German Ministry of Research and Technology has reservations to fly 25 materials-processing experiments aboard future space shuttle missions, said Kennedy Space Center spokesman Rocky Raab. (THE ORLANDO SENTINEL, 8-17-82, p. B-4)

August 17: NASA's John F. Kennedy Space Center has awarded Hall-Mark Electronics of Orlando, Florida, a contract for additional firing room equipment.

Four operational firing rooms will eventually be needed to fulfill the ambitious flight schedule of the Space Transportation System's fleet of four orbiters. Two of the four firing rooms are operational and are used for orbiters Columbia and Challenger.

The firing rooms, located in the Launch Control Center, are equipped with a highly automated launch processing system designed to automatically control and perform Shuttle checkout and launch activities.

The launch processing system continually monitors thousands of measurements of temperatures, pressures, flow rates, liquid levels, turbine speeds, voltages, currents, valve and switch positions, and many other parameters.

The Remote Control Video Switcher System (RCVS) routes data from the orbiter to the Launch Control Center and then distributes the data to the appropriate firing room. This switcher system will need to be expanded before firing rooms three and four can become operational.

Hall-Mark Electronics, under a firm, fixed-price contract, will deliver micro module chassis and peripheral equipment required for the expansion of the remote switcher system.

The contract has a value of \$36,984 and the equipment is due to be delivered by October 1, 1982. The third firing room is scheduled to be ready by December of 1982 and the fourth should be complete by December of 1983. (NASA NEWS RELEASE NO. 194-82, 8-17-82)

August 19: Work has begun on what will be a \$15.5 million complex of buildings and equipment for processing and storage of Solid Rocket Booster segments for Space Shuttle missions.

Site preparation is well under way by W & J Construction Company of Cocoa, under a \$7.2 million contract to provide the labor, equipment and materials for construction of the complex to include the Solid Rocket Booster Rotation/Processing Facility and two accompanying SRB Segment Storage Buildings.

According to Ernest Lautzenheiser, lead design engineer for the project, the facility, designed by Daniel, Mann, Johnson, Mendenhall of Los Angeles, is slated for completion 18 months after the official commencement date of May 20.

Nick Witek, vice president of the W & J company, said most of the preliminary work on the site, located north of the Vehicle Assembly Building, has been completed.

W & J is no stranger to KSC construction work. Approximately 18 months ago, Witek noted, the company won the \$6.7 million contract for modification of Launch Pad 39B for Space Shuttle use.

The firm has been located in the Cocoa area for 17 years, and has built commercial and industrial buildings, offices and churches, with an estimated 50 percent of its business involved with contracts with NASA and the U.S. Air Force.

Under the present SRB processing system, the live solid motor segments for the boosters are received, processed and inspected in the VAB. The aft skirts and aft propellant segments of the SRB's are also assembled there.

NASA spokesmen said moving these operations to a separate building will reduce hazardous conditions in the VAB.

The move also will avoid impacting the VAB's launch support capability by eliminating scheduling conflicts between hazardous work involving the SRB's and non-hazardous operations on the orbiter, external tank and assembled booster rockets.

Location of the SRB work in a separate facility, noted Project Engineer Alfredo Teran, also will allow efficient and economical handling of operations during normal working hours, concurrently with ongoing work in the VAB.

When completed, the new facilities will allow storage of two sets of SRB's, with capability to support more than 20 launches per year. (SPACEPORT NEWS, 8-19-82, p. 7, Vol. 21, No. 17)

<> "I felt like I won the Olympics," said Walter Bond, a former track star, after witnessing the fourth launch of the Space Shuttle Columbia, his first "in person" liftoff.

Bond is from Windsor, North Carolina, and is a senior honor student majoring in biology at North Carolina Central University.

Through the Minority Access to Research Careers/Honors Undergraduate Research Training Program of the National Institutes of Health, he is able to work for eight weeks this summer at KSC in the cardiovascular physiology laboratory. Dr. Mary Anne Frey, technical manager in charge of the biomedical research lab in the O & C Building, designs his work programs.

Bond performs chemical analysis, works in the stress lab, and works with lab technicians analyzing blood and blood serum.

As a student, he has a research obligation to fulfill. Students are required to complete an external research experience while involved at the university. To fulfill his requirements he is working with NASA on red blood cell degeneration and red blood cell count in athletes. Another aspect of the study is cardiac output, calculations and measurements.

Bond receives a one-hour credit toward his degree by doing research outside of NCCU. His goal is to obtain a doctorate in biomedical research.

He was recommended by his professors for the MARC program, Minority Access to Research Careers. The program pays for transportation, gives the students a monthly stipend plus a salary, and pays for fees and tuition the last year of their undergraduate education. In return, the student must maintain a 3.0 average and complete a required external research study.

Dr. John Ruffin, director of the MARC program at NCCU said, "The objective of the program is to educate and encourage the minority student to strive for a doctorate in the biomedical sciences."

"Kennedy Space Center is a fantastic site for students because it's not an academic setting. Walter is getting a meaningful experience because there are a number of activities going on here besides his own work," added Dr. Ruffin, who is also chairman of the Department of Biology at NCCU. (SPACEPORT NEWS, 8-19-82, p. 2, Vol. 21, No. 17)

August 22: The open cargo bay of the Space Shuttle might not be the ideal place for sophisticated cameras and telescopes as NASA engineers once thought. For the Air Force, which depends on such optical equipment in surveillance, the view from the Shuttle could be obscured by the spacecraft's own "pollution."

Preliminary findings from Columbia's third mission in March showed that rocket exhaust, water vapor and particles from the Shuttle's own exterior played havoc with an experiment designed to study the effects of space flight on optical equipment....

Dr. J. L. Weinberg [a University of Florida physicist] said it is premature to say whether these problems are insurmountable but "there will be quite a bit of work ahead of us." (TODAY, 8-22-82, pp. 1A & 16A)

<> Thousands of Kennedy Space Center employees and their families flocked to the center Sunday for its first open house in four years and heard Shuttle astronauts Thomas "Ken" Mattingly and Henry Hartsfield thank them for their successful seven-day mission.

Many in the crowd cheered the astronauts who completed Columbia's fourth and final test flight with a July 4 landing at Edwards Air Force Base in California.

"You can't imagine how much magic there is in that machine," Mattingly said of the Space Shuttle Columbia and its booster rockets.

"For seven days, we leaned on things to try to find problems for our reports, but we couldn't find any," he said of the mission. "When you read zero defects, it means, 'Made in the U.S.A.'"

Mattingly, who also flew on the Apollo 16 lunar mission, said, "I believe your performance is more professional now than during Apollo."

Hartsfield, whose wife Fran was in the audience, said, "It was the greatest experience in my life to float in that spacecraft."

"Only in America can you produce a machine like that," Hartsfield said. "It was the best ride I ever had. We didn't want to come home, and I'd go again today if there was a Shuttle stacked out there."

Speaking to youngsters seated on the ground before the platform placed in front of the Orbiter Processing Facility, Hartsfield added, "You children now will be able to do things in space that we can't even imagine."

Through the open doors of the OPF, the Orbiter Challenger could be seen behind the astronauts.

The two astronauts presented Kennedy Space Center Director Richard Smith with a flag and a patch from their mission mounted on a plaque. Smith, in return, gave them colorful photographs of their launch.

Employees and their families are allowed to tour a number of areas that normally are not open to the public, said KSC spokesman Hugh Harris. Besides seeing the Challenger, they were shown the European Spacelab, the firing room, some payload areas and laboratories. In addition, one of the 54-foot diameter parachutes that help break the solid-rocket boosters' fall to the ocean was on display.

Although final crowd estimates were not available Sunday night, an estimated 10,000 people passed through just one of the center's four gates.

Although employees enjoyed themselves Sunday, NASA is prepared to lay off 2,100 of them for up to 10 days if the U.S. Senate and President Reagan fail to approve a \$14.2 billion supplemental money request to help meet government expenses through the fiscal year's end September 30. The measure already has been approved by the House.

If layoffs occur, Harris said KSC would try to schedule them to cause the least possible effect on Columbia's next launch scheduled November 11. (TODAY, 8-23-82, p. 1A)

August 24: Columbia Boulevard will join the high-flying ranks of NASA and Apollo Boulevards this week as the latest Brevard thoroughfare named for the space program.

In a ceremony scheduled for Thursday, NASA and local elected officials will unveil a new road sign for a four-mile stretch of SR 405 renamed in honor of the Space Shuttle Columbia. Columbia Boulevard will run from SR 50 east to gate three of the Kennedy Space Center.

The idea to rename that portion of SR 405 was discussed by Brevard County commissioners earlier this year. During the last session of the state Legislature in March, the name change was introduced by state Sen. John Vogt, D-Cocoa Beach, and Clark Maxwell, Jr., R-Melbourne.

It passed easily in both houses, Vogt said. He called the new boulevard part of "local pride" in the space program and four successful Shuttle test flights.

Brevard already can claim an Astronaut Boulevard, Apollo Boulevard, NASA Boulevard, and schools named Apollo, Gemini, Freedom 7, Saturn and Astronaut. But Columbia Boulevard is the first public road dubbed for a Shuttle achievement. (TODAY, 8-24-82, p. 1B)

<> Astronaut Sally Ride, the first American women scheduled for a flight in space, tried her hand at firefighting at Kennedy Space Center Tuesday. Astronauts for the next three Shuttle mission started their emergency training Friday and Tuesday's class was the last. Ride will fly on the 7th mission set for April 1983 with Bob Crippen, Fred Hauck and John Fabian. (TODAY, 8-25-82, p. 10A)

August 25: They had more fun in the old days of rocketry.

Take the gang who tested rocket engines in a Bell Aircraft facility at Niagara Falls, N.Y., 30 years ago.

They'd put the Rascal and Hustler engines in the test firing stands, recalled NASA's Dr. Robert Gray, then in charge of rocket instrumentation activities at the Bell plant. He's now top Shuttle man at the Space Center.

"We used to keep score on rocket explosions," Bob told us, "to see who could blow the water-cooled nozzle the farthest across the fence into the Carborundum Corp. plant."

Nozzle weight: 300-400 pounds!

In those early days of rocket motor development, in the early '50s, "there were engine explosions sometimes several times a day, certainly several times a week," Bob said.

"Sometimes they were major."

A good-sized explosion would send the nozzle hurtling into Carborundum property, much to the dismay of that company's management and workers.

"They were very much displeased," Bob noted. Not only would Bell's neighbors be assailed by a massive piece of metal, but the explosions "blew windows out and set their coal pile on fire." (TODAY, 8-25-82, p. 1B)

August 27: Cocoa Beach may have the right location but apparently not at the right price.

The production company of "The Right Stuff" -- the film being born by the Tom Wolfe book about America's seven original astronauts -- decided Thursday that a \$100,000 price tag for shooting a film segment here was the wrong number.

In its on-again/off-again brush with stardom, the Cocoa Beach City Commission early Thursday evening had approved a request by the Ladd Co. to film one day along Minuteman Causeway. The written request from location manager Rory Enke said filming would start either Wednesday or Thursday.

Mayor Dave Brown and Commissioners Jack Kuritzky and Mary-Francis Vaughn, the three council members present at the 5 p.m. special meeting, quickly approved the request, then went on with a 90-minute budget workshop.

But at 7:25 p.m., Brown got a call at home from an apologetic Enke, who said the \$100,000 cost of moving actors and equipment from San Francisco to Cocoa Beach had killed the idea of filming in Florida. Brown said Enke told him the decision had just been made in a production meeting in California. (TODAY, 8-27-82, p. 1B)

<> NASA's newest high-powered rocket launched into space without a hitch at 7:10 p.m. Thursday from Cape Canaveral Air Force Station with a Canadian communications satellite perched on top.

The Anik D satellite should provide northern and western Canada with 24 color television channels when it goes into service by September 21. The \$30 million satellite was lifted into the upper reaches of the atmosphere at a speed of more than 12,000 miles an hour leaving a corkscrew of smoke in its wake.

The thundering fireball could be seen clearly as far as 12 miles up in cloudless skies. Nine small strap-on booster rockets gave the 116-foot-tall Delta launcher its initial kick from a newly refurbished launch pad.

Pad 17B was last used in 1979 and after an almost \$1.8 million face lift, the pad is ready to accommodate as many as 12 of the new Delta launches a year, said Charles Gay, director of Kennedy Space Center's rocket operations.

The new upgraded Delta rocket is capable of lifting 400 more pounds of satellite into orbit than its predecessor. And Thursday's textbook launch marks the lifting of the heaviest satellite ever by a Delta rocket, officials said.

The first launch of the upgraded Delta was made from Vandenberg Air Force Station, California, in July.

Although weather at the launch site appeared threatening about 5:30 p.m. Thursday, it cleared by liftoff, said Dick Young, NASA spokesman.

Anik D will circle the globe over Western Canada near Winnipeg and should be operating from a height of 22,000 miles, said officials of Telesat of Canada.

"Essentially Anik D will more than double satellite communications in Canada," said William Zatychec, director of Telesat's satellite division.

The satellite's lifetime is about nine years.

Originally set to launch August 19, liftoff was pushed back a week because of problems with electronic equipment on the pad. The electronics package, which controls ground support equipment, was repaired earlier this month. (TODAY, 8-27-82, p. 16A)

August 29: Cowhands are moving 3,000 cattle by barge to the mainland to allow a firm trying to become the first private space agency to finish preparations for its second attempted rocket launch.

The solid fuel rocket, Conestoga 1, is scheduled to blast off September 8 on a suborbital mission from the southern end of the island, /Matagorda, Texas/ site of last year's ill-fated launch.

The Minuteman rocket, purchased from the National Aeronautics and Space Administration, will be placed on a concrete block Tuesday and surrounded by a steel gantry, officials said. (TODAY, 8-29-82, p. 20A)

August 30: President Reagan does not have enough votes at this point to win a fight in Congress over his veto of a \$14.2 billion supplemental appropriations bill, a White House official said Sunday.

"We start from a position that we've started from many times before, and that's behind," said White House deputy press secretary Larry Speakes.

However, he said Reagan would do whatever is necessary to win a veto showdown that will take place when Congress returns from its vacation September 8.

Because of Reagan's veto of the bill, Kennedy Space Center would temporarily shut down if it is forced to lay off its 2,100 federal civil service workers because of a fund shortage, "but that's very unlikely," space center spokesman Hugh Harris said Friday.

About half of the work force at Johnson Space Center in Houston, or 3,400 workers, is employed under civil service law, and spokesman Steve Nesbitt said preparations for the Shuttle's fifth mission could not continue without them.

Astronauts who are not in the branches of the military are covered by civil service law.

Harris said officials at KSC have been "looking at plans to reduce the amount of time people would have to be laid off. It's a matter of determining - down to the last penny - how long we can continue to pay people and allow them to work."

If layoffs occur, Harris said, the space center will try to do it in such a way as to have the least possible effect on the Shuttle launch.

Officials at Patrick Air Force Base, with 3,000 military and 2,000 civil service personnel, said the overall impact - if any - could not yet be determined.

The key question is whether Republicans will stand with the president in this fight. (TODAY, 8-30-82, p. 3A)

<> U.S. Rep. Bill Nelson, the Melbourne Democrat whose district includes the space center, said he still was confident the layoffs could be avoided.

"We can put an acceptable bill together and have it ready for the president's signature by the middle of September," Nelson said.

"The only thing that could possibly get in the way would be if there were some significant showdown between Congress and the president over some other part of the bill," Nelson said.

The fiscal year of the federal government begins October 1. Funding as of that date has already been approved.

Funds for the space center are projected to run out on September 20. (THE ORLANDO SENTINEL, 8-30-82, p. A-9)

August 31: A Casselberry woman filed a negligence suit Monday against NASA, charging that a water fountain she drank from in 1980 at the Vehicle Assembly Building contained parasites that made her sick.

Cheryl Ann Burt and her husband, Larry, charged that NASA, Boeing Services International Inc. and its insurer, Aetna Life and Casualty Co.; and Rockwell International and its insurer, Traveler's Insurance Co., were negligent in maintaining the quality of drinking water at the space center. The suit, filed in U.S. District Court in Orlando, asks for an unspecified amount in damages.

Mrs. Burt, who worked as a messenger for Atlantic Technical Services, was delivering mail to a Rockwell office in the Vehicle Assembly Building on November 6, 1980, when she drank from a second-floor water fountain and later became sick, the suit says.

The suit charges that the water contained "giardia parasites," which it claims are dangerous to humans and often are found in contaminated water. It states that the woman became "seriously ill" and required hospitalization.

Burt's husband joined in the suit, charging that he has suffered from the loss of "services, companionship and comfort" of his spouse.

In a claim filed with NASA earlier this year, the woman charged that she lost weight and suffered permanent damage to her gastro-intestinal tract. The claim also states that she has been forced to take "toxic drugs" to combat the condition, which may result in "further complications."

A NASA spokesman was not available for comment, but NASA chief counsel Edward Parry denied the woman's injury claim earlier this month. Parry wrote in a letter August 2 that Burt's claim was a "product of mere speculation" with no proven link to NASA.

Rejection of the claim allowed Burt to take the case to federal court. (THE ORLANDO SENTINEL, 8-31-82)

SEPTEMBER 1982

September 1: United Space Boosters, an operating unit of United Technologies' Norden Systems subsidiary, has won an extension of its current contract to perform processing operations for the solid rocket boosters used on the Space Shuttle.

The contract extension is valued at \$12,604,000, bringing the cumulative value of the company's contract with the National Aeronautics and Space Administration to \$54,331,737. Under the contract, the company provides for receiving inspections of the booster segments, nozzle assemblies, nozzle extensions, and associated hardware. It also provides for assembly and checkout of the various parts of the booster through pre-launch, launch, post-launch, recovery and disassembly operations.

The cost plus award fee contract extension covers the period from April 1 through December 31, 1982. (NASA NEWS RELEASE NO. 198-82, 9-1-82)

September 2: A 37-foot-surplus military rocket is poised on a sandy Texas Island, ready for the first launch of a spacecraft by private enterprise, a Houston company announced Wednesday.

The solid-fueled rocket, named Conestoga 1, is scheduled to carry a dummy payload to 192 miles above the earth where it will eject a shower of ice crystals and then fall into the Gulf of Mexico.

Space Services Inc. of Houston is spending about \$2.5 million for the project. The company's chairman, David Hannah, said the firm plans to develop a launch system that can carry satellites into low earth orbit for commercial customers. (TODAY, 9-2-82, p. 12A)

<> It didn't take animal care specialists from Sea World long to decide what to name the injured manatee they rescued from Sykes Creek last May.

There was something about the expression on the gentle sea mammal's face...and the spunky 3-5 year old animal's spirit clinched it, said Sandra Garrett, animal information representative from Sea World. "We knew she'd be going home -- so it seemed natural to name her 'E.T.'"

E.T., injured when she tangled a flipper in a crab trap line, was transported to Sea World after Florida Marine Patrol officers called for assistance.

The 535-pound creature began eating right away, and with the help of daily treatments, overcame the deep cut she had suffered. After three months, she was ready to return to the lagoonal waters that are her natural habitat.

E.T., painlessly marked for future research on her movements, received a celebrity sendoff. Under the direction of Glenn Young, assistant curator of mammals and birds, she was taken in a special conveyance to KARS Park on the shore of the Banana River where a group of manatees have been sighted.

Witnessed by KSC Director Dick Smith and heavy representation by the news media, and assisted by Sea World personnel and U.S. Representative Bill Nelson who rolled up the legs of his trousers and helped hoist the seven-foot, four-inch animal into the water, the release of E.T. was accomplished on September 2.

When last seen, E.T., escorted by marine patrol craft that kept motorboats away from the area, was headed for open water. (SPACEPORT NEWS, 9-21-82, p. 6, Vol. 21, No. 19)

September 3: A management-initiated "lockout" of 225 security guards was averted at Kennedy Space Center Friday /Sept. 3/ when Wackenhut Security Inc. employees accepted a salary freeze for the next 15 months followed by a 5.7 percent pay increase.

In a letter to union representatives, Wackenhut officials threatened to refuse to allow the employees to work after 10 p.m. Friday unless the two sides reached an agreement.

The lockout would have been the first work stoppage forced by management at the government installation, said union President Al Scholar. (TODAY, 9-4-82, p. 1B)

September 4: A piece of a broken Shuttle booster rocket buried 3,500 feet beneath the Atlantic Ocean may see the light of day sometime this week, NASA officials said Saturday /Sept. 4/.

The 40-foot-long section of the left-hand rocket -- complete with two parachutes and flight recorders -- will be lifted from the sea with the help of a remote control salvaging device on a Navy vessel, NASA spokesman Rocky Raab said.

The Navy vessel and United Technologies Co.'s Freedom left Port Canaveral Friday for the site 150 miles out at sea. Freedom is a rocket retriever boat.

A camera, attached to a robot submarine called the SCARAB, will search the ocean floor for any other flight recorders that may have been buried under the rocket piece.

Raab said it will be several days before cables are attached to the 20-ton steel casing and it is slowly reeled up.

The booster rockets, which gave the Shuttle its initial lift into the upper atmosphere June 27, were supposed to be recovered after launch. But a failure in the parachute systems doomed the rockets to a watery grave in the Atlantic. (TODAY, 9-5-82, p. 20A)

September 7: NASA's John F. Kennedy Space Center has awarded a \$11,521,430 extension of a current contract to Martin Marietta Corporation, Denver, Colorado, to perform External Tank processing operations for the Space Shuttle. The cumulative value of the company's contract with the National Aeronautics and Space Administration to provide these services is \$54,322,823.

Under terms of the contract, Martin Marietta will provide for planning, control and performance activities which will ensure that the External Tank and associated support equipment will operate within specifications. Martin

Marietta will also provide engineering capability to implement facility and equipment modifications associated with the External Tank. The cost plus award fee contract covers the period from April 1 through December 31, 1982. (NASA NEWS RELEASE NO. 199-82, 9-7-82)

- <> The Defense and Systems Group of TRW, Incorporated, Redondo Beach, California, has been awarded an extension of a contract to provide spare parts for payload integrators and payload signal processors for the Space Shuttle. The parts will be manufactured at the TRW plant in Redondo Beach and in Colorado Springs, Colorado.

The contract totals \$1,614,000, bringing the cumulative value of the TRW contract to \$5,795,549. The cost plus fixed fee contract calls for the spare replacement units to be delivered to the Kennedy Space Center in August, 1984. (NASA NEWS RELEASE NO. 200-82, 9-7-82)

- <> Rockwell International Corporation's Space Systems Group of Kennedy Space Center, Florida, has won a \$94,667,400 extension to its Space Shuttle processing contract here.

The contract extension calls for Rockwell to perform normal processing functions to prepare the Space Shuttle Orbiter for launch at Kennedy Space Center. The work includes all aspects of preparation of the orbiters, their main engines and other hardware during pre-launch, launch and post-landing activities.

The cost plus award fee extension brings the total value of the existing contract to the sum of \$416,534,543. The contract has been in force since January 1, 1977, and this extension covers the period from March 31, 1982 through December 31, 1982. (NEWS RELEASE NO. 204-82, 9-7-82)

September 9: An 18-year-old biology student hopes to gain insight into the healing process in space when the shuttle Columbia carries 18 samples of Florida Gulf Coast sponges on its next mission in November.

For millions of years, tiny cells have easily assembled into healthy ocean sponges. In the weightlessness of space, that natural formation may be thwarted, the student, Aaron Gillette, believes. Mr. Gillette, who comes from Winter Haven, Florida, and is attending Western Carolina University, says that if that is the case, healing an astronaut's wound in flight may be equally difficult.

The small sponges, called porifera, will be disassembled into one-cell organisms before the launching November 11. Mr. Gillette said cameras would record any sponge formation. (THE NEW YORK TIMES, 9-9-82)

<> Claude Davis, an aerospace engineer at Kennedy Space Center, will be recommended to Governor Bob Graham for an appointment to the state Public Service Commission, the PSC Nominating Council decided Wednesday.

"My initial reaction is, I'm very pleased the nominating council thought I was qualified," said Davis, a Rockledge resident. "I feel I am the best person for the job on the PSC."

The council whittled a list of 68 applicants to eight finalists who will be interviewed for two vacancies on the commission. Six Brevard County residents were among the 60 applicants cut Wednesday.

Among those selected were Davis and two incumbent PSC members, Joe Cresse and Gerald Gunter, a former Titusville city councilman. Both are seeking reappointment to the PSC.

If he doesn't make it this time, Davis said, he'll try again: "It took Ronald Reagan 12 years to get to be president." (TODAY, 9-9-82, p. 2B)

<> The Space Shuttle Columbia starts the first 300 yards of its fifth mission at noon today with a tow from its hangar to the Vehicle Assembly Building.

In preparation, technicians at Kennedy Space Center changed one of the spacecraft's 44 1/2-inch tires Wednesday, said KSC spokesman Jim Ball. He said by midnight Wednesday the 122-foot-long Columbia was to be lowered on its landing gear.

From there the airplane-like Columbia is weighed to determine its center of gravity. That's necessary to check flight computer programs that depend on the center of gravity for guiding flight.

"We're ready to roll it (Columbia) out by noon but if they can go a little earlier, they will," Ball said.

Once the Columbia is in the 525-foot-high Vehicle Assembly Building it will be connected to two booster rockets and an empty fuel tank. By late September the fully assembled spacecraft will be moved to the launch pad for a November 11 launch.

The fifth Shuttle mission is dedicated to putting two communication satellites into orbit. (TODAY, 9-9-82, p. 14A)

September 10: Space Shuttle Columbia made a mad dash between rainstorms from its "barn" to the Vehicle Assembly Building Thursday afternoon. Along with the weather, a stuck VAB door pushed Columbia's first steps back almost a day.

Once inside the 525-foot-high assembly building by 5:20 p.m., Columbia was prepared for stacking with its two booster rockets and a peach-colored fuel tank. Workers began immediately to wrap a sling around Columbia's belly to hoist it into a vertical position. It will be lifted by a crane late today and bolted atop its mobile launch platform.

The full assembly of the Shuttle should be completed by Saturday and is scheduled to head to the launch pad September 21, said James Harrington, chief of Orbiter Operations at Kennedy Space Center.

Despite the minor problems Thursday, Harrington said Columbia should be ready to fly its fifth mission into space by November 11. On that mission, the spacecraft will carry four men and two communications satellites into orbit.

Columbia was in its hangar for 41 work days where engineers repaired all damaged heat protection tiles.

"This is the first time we've come over to the VAB with zero cavities," said Harrington, referring to the fact that tile work was completed in the hangar.

Challenger is currently being worked on in the same hangar Columbia left behind.

"The work on Challenger will pick up a bit now that Columbia's out of the barn," Harrington said. (TODAY, 9-10-82, p. 16A)

- <> NASA has called off plans to dredge a 40-foot-long section of a broken Space Shuttle booster rocket from the ocean's bottom.

The two rockets used to lift Columbia into the upper atmosphere, sank 3,500 feet in the Atlantic after the last launch in June. The rockets were supposed to float and be recovered, but parachutes failed. The rockets crashed to the sea 150 miles off the Brevard coast.

On September 4, a board investigating the failure recommended that rocket piece with its flight recorders be dredged with the help of a Navy vessel.

Underwater photographs taken since then have provided enough information about the failed parachutes, making it unnecessary to recover the recorders, NASA spokesman John Taylor said Thursday. (TODAY, 9-10-82, p. 16A)

- <> The first rocket by a private company planning to orbit satellites blasted off Thursday from Matagorda Island, Texas. It flew a 10 1/2-minute suborbital mission before splashing down in the Gulf of Mexico.

"Everything looked perfect. It went right on down the pike," said mission director Deke Slayton, a retired astronaut.

Conestoga I, a gleaming white, 37-foot-tall rocket, climbed to an altitude of 192 miles, arched over the Gulf and separated from a dummy payload that spewed 400 pounds of

water into space. The payload and rocket splashed down 321 miles from the launch pad.

The launch from the tiny coastal island by Space Services Incorporated of America was a "victory for private enterprise," said company founder and board chairman David Hannah, a Houston businessman.

"This showed that a group of private investors can get together and launch a rocket in a responsible way and well within a commercially feasible limit," said Hannah.

Hannah said a dozen oil companies have expressed interest in using SSI to place satellites in orbit to monitor oil wells in remote sites and to search for minerals and oil deposits.

SSI plans to build a multiple-stage rocket system capable of orbiting a 500-pound satellite about 500 miles above Earth.

Conestoga I was built around a solid-fuel rocket motor from a surplus Minuteman missile. SSI bought the motor from NASA for \$365,000 and hired a contractor, Space Vectors Incorporated, to build the spacecraft.

Next on SSI's agenda is launching a satellite and raising \$15 million to \$20 million to finance it, Hannah said. The company has yet to obtain a launch site but is negotiating for a location in Hawaii, he said. (TODAY, 9-10-82, p. 1A)

September 11: A record crowd poured into KARS Park on September 11 to picnic on chicken, beer, cola and ice cream and defy threatening rain clouds to make the NASA - Contractor Family Picnic and Fair the most successful ever.

While scattered showers seemed to soak everything in the vicinity except the park, 2,430 NASA and contractor executives and workers played games, vied for prizes and listened to music.

Picnickers played horseshoes, volleyball, softball, tennis and shuffleboard, swam and cheered for their favorite team in the Tug-O-War.

Arriving by car, boat, motorcycle and motor home, they cheered the youngsters in their events, including a sack race and a balloon stomp.

They did double takes when they belatedly realized that the guy who took their tickets or handed them an ice cream was a high-ranking NASA executive.

They lined up to send NASA's Henry Paul, Tom Wirth of Martin Marietta, Paul Donnelly of USBI, Al Reeser of Rockwell International and Bob Foster of CSC into the dunk tank. Former top-level officials Lee Scherer and Miles Ross joined Dick Smith and George Page in the festivities. The crowd was swelled by a contingent of European visitors in enthusiastically cheering on a soccer match, patronized fair booths until they ran out of prizes and applauded as the park's new "River Breeze Pavilion" was dedicated. (SPACEPORT NEWS, 9-17-82, pp. 4 & 5, Vol. 21, No. 19)

<> Kennedy Space Center workers Friday began the tedious process of mounting the space shuttle vertically atop its mobile launch platform in preparation for its fifth mission.

The 10-hour operation, which followed Thursday's rollout of the 100-ton orbiter to the Vehicle Assembly Building, began about 4 p.m. and was expected to be completed about 2 a.m. today, said spokesman Hugh Harris.

Once atop the mobile launch platform, Columbia will be mated to its external 15-story fuel tank and solid-fuel rockets. Its fifth mission -- the shuttle's first as a full-blown space ferry after four test flights -- is scheduled to begin November 11. (THE ORLANDO SENTINEL, 9-11-82)

September 13: It looked like something out of the Neiman-Marcus catalog, an outlandish toy for the Texan who has everything.

But the stubby rocket that thundered into space last week above a Texas cattle ranch may signal the start of a new era of commercial spaceflight.

"We feel we can offer a service that NASA cannot," said David Hannah, a Houston real estate developer who heads Space Services Inc., which sent the 36-foot Conestoga rocket 195 miles above Earth.

The David-and-Goliath challenge did not fall on deaf ears. Despite four successful space shuttle missions, NASA is struggling to overcome financial and scheduling problems with the \$17 billion shuttle program. Critics say the agency has become a bloated and arthritic bureaucracy since its glory days in the early 1960s.

"We don't have a big paper mill and a lot of people flopping around," said Deke Slayton, 58, a former Mercury astronaut who retired from NASA this year to join Space Services. "We all know what we're going to do and we do it."

A few high-ranking NASA officials have jumped ship to join the maverick Texas space program, which has only seven full-time employees.

Lee Scherer, who supervised 66 launches during his five years as the director of the Kennedy Space Center, said NASA has no more business launching rockets than it does running a commercial airline.

"The government should not be involved in anything that private enterprise can do," said Scherer, who was hired by Space Services to negotiate the lease of two Atlas-Centaur launch pads at Kennedy Space Center.

Despite their boastful bluster, Space Services officials are relying heavily on NASA support. Without a government surplus booster, bought for \$365,000 from NASA, Conestoga would still be earthbound.

But one successful flight isn't much of a track record, and some analysts doubt that Space Services could survive a second disaster. The company's effort to lease Atlas-Centaur launch pads from NASA stands a much greater chance of success.

General Dynamics also has expressed an interest in leasing the two pads at Kennedy Space Center, Mahon said. Because the two pads are on Air Force property and built with

taxpayers' money, it would take a "major policy statement" from the Reagan administration to approve such a lease, he said.

"It would be easy to just hand it all over, but intermingling private business and government would be rough," Mahon said. The space agency may form a task force to explore a possible rental arrangement, he said.

"The party line in NASA is that expendable rockets will be phased out and they've taken steps to make that happen," said Bonesteel, of General Dynamics. "Because of the uncertain situation of the shuttle program the phase-out has been delayed far into the future." (THE ORLANDO SENTINEL, 9-13-82, pp. 1A & 8A)

- <> Multibillion-dollar shuttle processing competition is in a critical phase as contractors attempt to align themselves into teams and the National Aeronautics and Space Administration completes what it hopes is a comprehensive request for proposals scheduled to be issued to the industry by the end of November.

The shuttle processing contract is intended to replace nearly two-dozen individual contracts, and to enable NASA to back away from day-to-day supervision of the processing cycle into what will essentially be an auditing role. A single contract is to be awarded, but the winner is expected to head a team consisting of some of the biggest aerospace companies in the U.S.

Assessments by potential bidders that observed space shuttle system processing for the third mission earlier this year divided into two divergent philosophies:

* Processing the space shuttle is a complex, technical operation that can be successful from mission and schedule standpoints only if done by the experienced element contractors until system maturity is assured.

* Processing the space shuttle is essentially a management task. The shuttle system is mature and design engineering is giving way to sustaining engineering.

The incumbent contractors -- Rockwell for the orbiter, Martin Marietta for the external tank and United Space Boosters for the solid rocket boosters -- subscribe to the first philosophy. Boeing, Lockheed and Grumman believe shuttle processing is a management task and that they are individually capable of taking over this job. (AVIATION WEEK & SPACE TECHNOLOGY, 9-13-82, p. 77, Vol. 117, No. 11)

September 15: Holloway Corporation, a Titusville construction company, has won a \$63,377 contract by NASA to provide the labor, equipment, and materials for the installation of Shuttle Inventory Management System II computer equipment in the central instrumentation facility at Kennedy Space Center. (TODAY, 9-15-82, p. 14C)

September 16: Jones Machine and Welding Shop of Merritt Island has been awarded a \$107,699 contract by NASA that is the result of a set - aside for a small business firm.

Under the terms of the fixed price contract, Jones Machine and Welding Shop will provide 36 hold-down bolts, which are approximately 4 feet long, 5 inches in diameter and weigh about 150 pounds. The hold-down bolts are expected to be delivered to the Kennedy Space Center in approximately five months. (NASA NEWS RELEASE NO. 207-82, 9-16-82)

September 17: Two astronauts will walk together in space for 3 1/2 hours during the space shuttle's mission in November, NASA officials said Thursday.

No American has walked in space since 1974, when astronaut Edward Gibson emptied film cassettes from a Skylab telescope.

An extra day was added to the Columbia's flight November 11-16 so mission specialists Joseph Allen and William Lenoir can put on 240-pound spacesuits, crawl through an air lock and tackle a few light chores in the shuttle's cargo bay.

"They've been assigned some make-work tasks with screwdrivers and wrenches, but mainly it's a test of the spacesuits," said Terry White, spokesman for Johnson Space Center in Houston.

The shuttle will carry two communications satellites and four crewmen during its fifth trip into space. The two satellites will be ejected from the shuttle by a spring-loaded turntable, then boosted into orbit by separate rocket stages.

The Columbia is scheduled to roll to its launch pad Tuesday.

Spacesuits worn by the shuttle astronauts are equipped with headlights, indoor plumbing, air conditioning and a supply of drinking water. The suits cost \$2 million each. Although astronaut Thomas Mattingly tried on a spacesuit during the fourth shuttle voyage in July, he did not leave the spacecraft.

During their spacewalk, Allen and Lenoir will be tethered to the shuttle by a safety cord. The 60-foot cargo bay also is equipped with hand and foot restraints so the astronauts can grope their way along the spaceship. The astronauts have spent dozens of hours submerged in underwater tanks at Johnson Space Center, testing the spacesuits to be used during their brief sojourn outside the shuttle.

SBS-C, a communications satellite owned by Satellite Business Systems, will be bounced from the shuttle on its first day in orbit. A second satellite, the Canadian-owned Anik-C, will be released on the second day.

NASA officials had been reluctant to schedule the spacewalk, fearing it might disrupt the satellite activity. "Everyone is pretty secure and confident about getting the satellites away and still do the spacewalk," White said.

The spacewalk will be a test of the astronauts' ability to tackle chores in space, including satellite repair and assembly of large structures in space. (THE ORLANDO SENTINEL, 9-17-82, p. A-1)

- <> A presentation of films, songs and dances has highlighted the observance of National Hispanic Week at KSC this week. Juan Rivera, a member of the Hispanic Employment Program Working Group that coordinated the activities, said, "One of our main purposes is to make Center employees aware of the involvement of Hispanics in the American culture and to create a community of people without prejudices because of race, ethnic origin or religion."

Rivera, an electronics engineer in the Experiment Processing Division, said Hispanic Heritage Week is also a good time to acquaint KSC employees with contributions Hispanic people have made to the space program and science and technology in general. "In this country," he said, "there is a tendency to look at Hispanics as foreigners. However, some of our ancestors were some of the earliest settlers here."

Currently there are 70 Hispanic federal employees at KSC, 58 male and 12 female. Of that number, 50 are engineers, and two of these are women.

In 1968 President /Johnson/ proclaimed the week which includes September 15 and 16 as National Hispanic Week in an effort to recognize Hispanic men and women who have played a vital role in the development and progress of this country. (SPACEPORT NEWS, 9-17-82, p. 2, Vol. 21, No. 19)

<> Space Shuttle Columbia blasted off from Kennedy Space Center Thursday and began orbiting the Earth before a malfunction forced technicians to abort the mission and land the spaceplane in Southern California.

And it did all that without ever leaving the ground.

A simulated launch, single-orbit flight and touchdown - a computer-fooling dress rehearsal for Columbia's fifth mission November 11 -- provided technicians with a chance to test the Shuttle's sophisticated computers in a mission-like situation Thursday.

Two of the four STS-5 astronauts, Mission Cmdr. Vance Brand and pilot Robert Overmyer, were aboard the Shuttle for the simulated liftoff and 1-hour, 45-minute mock flight.

"Everything was successful; I'm very pleased with the test," launch director Al O'Hara said minutes after the coverall-attired astronauts climbed from the Orbiter at the space center.

The elaborate exercise also tested the Orbiter's ability to successfully abort its flight during the first phase of the mission from launch until the craft is out of the Earth's atmosphere.

Thursday's exercise was the last major series of tests on the Shuttle before Tuesday's scheduled rollout from the Vehicle Assembly Building to the launchpad.

After going through the motions of a final countdown and liftoff, the astronauts were confronted with a simulated malfunction and were forced to abort the mock mission before one orbit was completed, NASA spokesman Jim Ball said. Astronauts then pretended to land the spaceplane at Edwards Air Force Base, California.

A 10-hour countdown preceded the astronauts' 1:45 p.m. entry into the Orbiter, but a slower-than-anticipated series of programming commands delayed the scheduled 2 p.m. liftoff for an hour, officials said.

The test concluded at 4:45 p.m., O'Hara said.

The Shuttle "interface" test, which takes nearly a week, is designed to check critical electrical connections between Columbia, its external propellant tank and twin booster rockets. Final launch preparations will be conducted once Columbia is moved to Pad 39A. (TODAY, 9-17-82, p. 20A)

<> "Dee is one of those people who performs his job enthusiastically, but quietly," said Clem DiLoreto, manager of project engineering for Martin Marietta's External Tank Operations.

DiLoreto was referring to Dee Trimble, ET Operations employee of the month for August, and hardware project engineer for the group.

Trimble has been a key member in managing Martin Marietta procedure developments for all Shuttle launches. His efforts have extended into all fringe-related areas involving approval and control of engineering paper.

"Dee prevents a lot of problems through upfront effort," praised DiLoreto. "He doesn't just react to a problem. He attempts to influence the situation before it becomes a problem."

Trimble's response to NASA requirements and requests draws high praise from all who work with him.

He joined Martin Marietta with the Skylab program in 1972, and has been a member of the ET team since 1976. He and his wife Judy have five children and live in Rockledge.
(SPACEPORT NEWS, 9-17-82, p. 6, Vol. 21, No. 19)

<> About 100 national delegates and representatives of NATO's Advisory Group for Aerospace Research and Development (AGARD) recently toured the space center as the concluding activity of their annual meeting.

The group's tour on September 17 included a viewing of the assembled STS-5 Space Shuttle, the orbiter Challenger, and the European-built Spacelab.

After being welcomed to KSC by Center Director Dick Smith and Col. Marvin Jones, commander of the Eastern Space and Missile Center, AGARD delegates and representatives received Space Shuttle briefings from Mission Specialist Astronaut, Dr. James van Hoftien and KSC's Sam Beddingfield.

The advisory group, which meets each year in a different member nation, was hosted this year by the United States.

The advisory group provides NATO member nations with an organization for scientific and technical exchanges and assistance in the aerospace field. (SPACEPORT NEWS, 10-1-82, p. 2, Vol. 21, No. 20)

<> Richard G. Smith, Director
John F. Kennedy Space Center
Florida 32899

Dear Dick:

Lifetimes are filled with memories, and KSC has certainly provided some of our most pleasant and vivid ones. Your hospitality Sunday was one of those events we will savor for a long time. We thoroughly enjoyed our visit and appreciated your making it possible.

There is never enough time to say all the things we'd like to, or adequate opportunity to personally convey our thoughts to the people who make things happen. We have had the privilege of being involved in the Shuttle program from the day we put our dream onto paper through the completion of the flight demonstration program. Throughout this period we have been impressed with the total dedication and perserverance of the entire NASA-contractor team. We have been particularly proud of using the KSC story as our example as we try to tell the nation how all of this magic happens. We didn't achieve an operational Shuttle after only four flights because of computers, exotic materials or elegant design but rather because thousands of Americans made a personal commitment that it won't fail because of me. This attitude can continually be seen at KSC.

Please convey our professional respect to all of your team and our sincere thanks for allowing us to be a part of your team for that short piece of history called STS-4.

Sincerely,

T.K. Mattingly
STS-4 Commander

Henry W. Hartsfield, Jr.
STS-4 Pilot

- <> NASA's John F. Kennedy Space Center has awarded a contract to a small business in Lakeland, Florida, Specialty Maintenance and Construction, Inc., valued at \$318,557. The award provides for Specialty Maintenance and Construction to perform fabrication and assembly of a multiuse mission support equipment payload handling fixture to be used in support of the Space Shuttle.

This payload handling fixture will be the first of its kind ever built. It will be an invaluable tool if a Space Shuttle orbiter is ever forced to land at a contingency landing site. The fixture will be equipped to facilitate the removal of payloads from the orbiter if such a situation should occur. The fixture will be a portable device divided into seven segments for easy transport. These sections can be flown via C-5 aircraft whenever needed and assembled on-site. When assembled, the payload handling fixture will weigh 70 tons, and measure approximately 70 feet long, 20 feet wide, and 18 feet tall. Once assembled, the device will roll on truck bogie wheels and be towed to the orbiter, where the payloads can be removed and transferred to the payload handling fixture.

The fixed price contract provides for the payload handling fixture to be delivered to the Kennedy Space Center early in 1983. It will be shipped to the Kennedy Space Center by truck, and will go to the Launch Equipment Test Facility. At that time, the segments will be assembled, placed on truck bogies and towed to a mock retrieval site to test its performance capabilities, with and without a test load. (NASA NEWS RELEASE NO. 213-82, 9-20-82)

September 21: The first European who will fly in an American spacecraft had a bottle of champagne to celebrate his selection as a crewmember for Spacelab.

West German Dr. Ulf Merbold has a year to drink it - he'll be flying inside the Space Shuttle's portable Spacelab in September 1983.

Merbold and Byron Lichtenberg of the Massachusetts Institute of Technology were named Monday as the men who will operate as many as 36 scientific experiments inside the 23-foot-long barrel called Spacelab, tucked in the Shuttle's cargo bay. Both men are scientists and are the first non-astronauts chosen for space flight.

Lichtenberg's specialty is the study of space sickness, and he theorized that nausea and disorientation in zero gravity is caused by confusion of inner ear organs that help maintain an upright posture. He may test his notions by floating free inside Spacelab while cameras record eye movements and body sensations.

The men also will draw blood from each other during the seven-day flight. Blood samples from space will be compared with samples taken before the flight to check the influence of weightlessness on infection-fighting white blood cells.

Even as well-rounded scientists, Merbold and Lichtenberg will have responsibility for experiments outside their fields, including a measurement of cosmic radiation inside Spacelab and the study of the chemical composition of the upper atmosphere. Many of these experiments will operate automatically, Merbold said.

Lichtenberg, 34, and Merbold, 41, were chosen from a field of four - two Americans and two Europeans. The other two

men, Michael Lampton of the University of California and Wubbo Ockels of the Netherlands, will serve as backup crew. The international team of scientists sponsoring the Spacelab experiments made the selections.

"There were no tests. We've all had the same amount of training, and I understand the vote was close," said Lichtenberg, adding a familiarity with a broad number of the experiments was an important factor.

Merbold, who is a physicist with the Max-Planck Institute for Metals Research in Stuttgart, predicted the success of Spacelab will "encourage Europeans to continue in the manned space program."

Said Lichtenberg, joking about the international flavor of the Spacelab mission, "The computers are French and the beverages are from Texas. We'd like to get that reversed."

The \$1 billion Spacelab, which was delivered in a U.S. Air Force C-5 transport to Kennedy Space Center last December, is almost fully assembled, said Harry Craft, NASA's manager for the Spacelab mission.

When Lichtenberg and Merbold fly in Spacelab during the ninth Shuttle mission they will be joined by four others: Shuttle astronauts John Young and Brewster Shaw and mission specialists Owen Garriott and Robert Parker. (TODAY, 9-21-82, pp. 1A & 10A)

September 22: With only one of its 32,000 heat protection tiles missing, the fully assembled Space Shuttle Columbia rolled from its hangar to the launch pad without a fumble Tuesday. The spacecraft's next move is a thundering launch into orbit between 7:19 and 7:59 a.m. November 11.

NASA officials also announced the Columbia will not stay in California after this mission as earlier planned, but will be returned to Kennedy Space Center for six months of modifications in preparation for its next flight in September 1983.

The space agency previously had considered towing the Columbia to its manufacturer in Palmdale, California, after it lands at Edwards Air Force Base November 16.

But by flying the Columbia on the back of a 747 aircraft to KSC, engineers at Palmdale will have more time to finish construction of the third Shuttle Orbiter -- Discovery, said Al O'Hara, Shuttle launch director. Discovery is scheduled for delivery to KSC late next year and a first flight in March 1984.

O'Hara said the bulk of Columbia's modifications after this flight are to prepare the spacecraft for a 23-foot-long, barrel-shaped Spacelab that will fit inside its cargo bay. Two scientists will conduct experiments for a week inside Spacelab on the ninth Shuttle mission.

On Tuesday, the Columbia, bolted to its two booster rockets and empty fuel tank, began its 3 1/2 mile march from the Vehicle Assembly Building at 5:14 a.m. and by 12:15 p.m. it was secured to the launch pad.

"We rolled out this morning with one (heat protection) tile left to be bonded at the pad -- so that was sort of a record for us," O'Hara said.

A total of 273 tiles were removed from the Columbia's skin after the last mission, and 170 of them were damaged from flight. (TODAY, 9-22-82, p. 16A)

September 23: An international communications satellite atop a 134-foot rocket at Cape Canaveral Air Force Station will not be launched today as planned. Engineers suspect an internal power supply could fail once the satellite is in space.

INTELSAT V was supposed to lift off from the pad at 7:07 tonight but mechanical problems detected in a similar satellite under construction in California gave engineers second thoughts. No decision has been made on a new launch date, said NASA spokesman Hugh Harris.

Engineers last weekend found problems in an unfinished satellite at Palo Alto, California, and decided late

Wednesday to study the power supply in the satellite poised for launch here, said Allen McCaskill, manager of INTELSAT launch operations.

The power supply in question is used to operate an electronics package that turns the satellite's 51-foot-long solar wings toward the sun. Without that maneuver, the satellite would not be able to collect solar energy for power in orbit during the seven years of its life.

Harris said if the power supply problem is found in the satellite sitting on the pad, it may have to be removed from the top of its 13-story Atlas Centaur rocket. Engineers would have to replace the failed parts, he said, noting he couldn't estimate the cost of replacing any failed satellite parts.

The \$35 million INTELSAT V is owned by 105 nations.

The 4,348-pound satellite is the fifth of a new series of nine satellites linking telephone lines between borders. This latest satellite, with maritime communications, would be the first to provide telephone service to ships at sea and offshore drilling platforms from ground stations. McCaskill said 37 countries would use the maritime channels.

INTELSAT V is designed to circle the globe in time with the Earth's rotation at 22,000 miles up.

In keeping with the international character of the project, INTELSAT satellites are built by Ford Aerospace in Palo Alto using components developed by firms in England, Japan, Germany and France. (TODAY, 9-23-82, p. 14A)

September 24: The launch of an Intelsat V-E communications satellite, which was postponed Thursday, has been rescheduled for Tuesday night, NASA announced.

The five-day delay will give technicians more time to study problems with a duplicate satellite at a Ford Aerospace and Communications Corp. plant in Palo Alto, California.

Intelsat V-E is the fifth in a series of nine communications satellites owned by the 105-nation International Telecommunications Satellite Organization. The satellite and its two-stage Atlas-Centaur rocket are valued at \$76 million. (THE ORLANDO SENTINEL, 9-24-82, p. B-2)

<> By signing on the dotted line, an executive of the National Park Service has guaranteed a serious study of alternate access to Playalinda Beach and ended a year of bitter controversy.

More than a year after its first release, the park service's southeast regional director, Bob Baker, formally approved a 10-year master plan for the Canaveral National Seashore last week.

The year long delay came when the Save Our Beach citizens group protested that it made no mention of future access to Playalinda Beach.

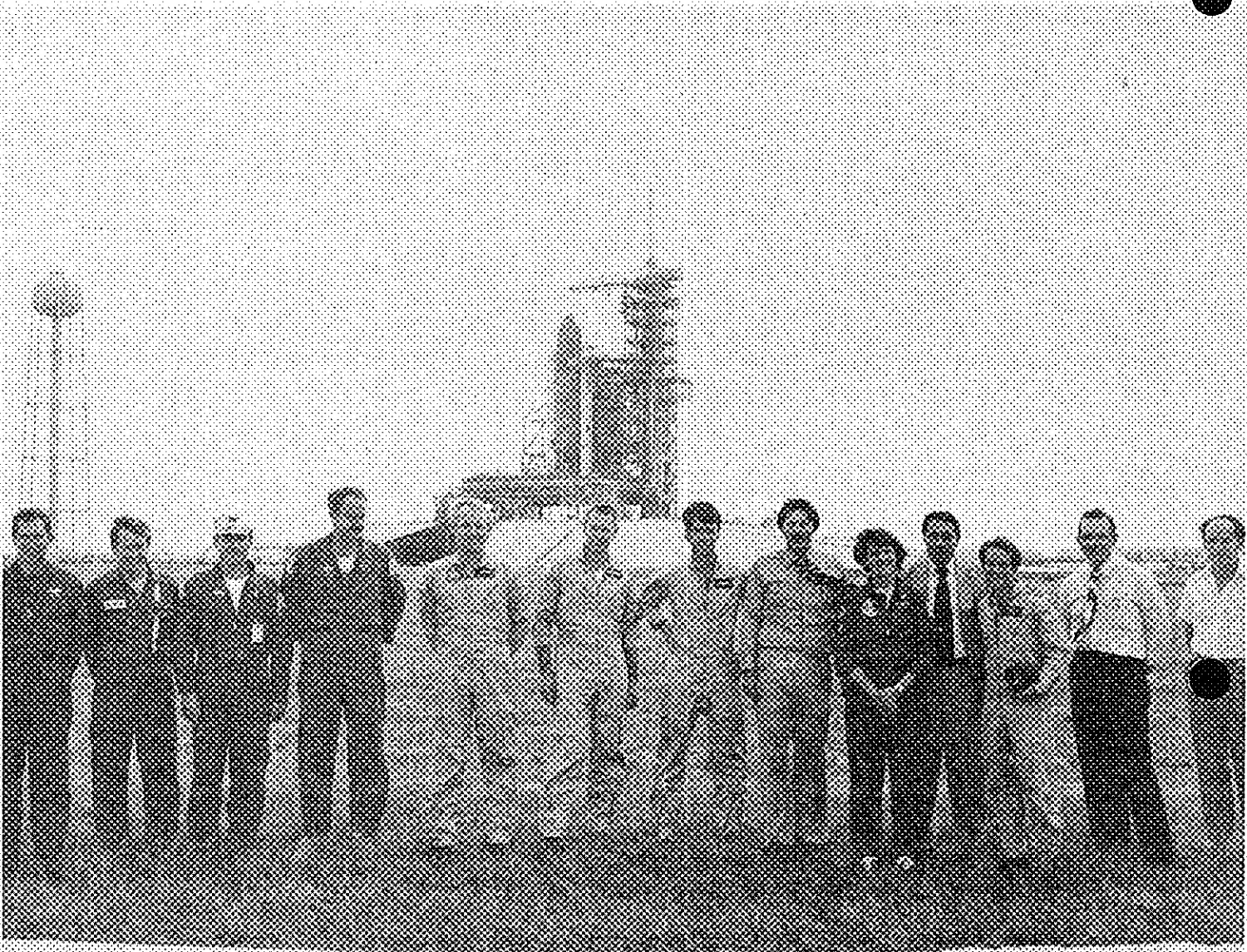
That future has been placed in jeopardy by increasing security requirements for the Space Shuttle program. The only access road, SR 402, lies within the 3-mile security perimeter of Launch Pad 39A, from which shuttles now are being launched.

Although beachgoers have been allowed to travel through the security zone most of the time the Shuttle has sat on the pad, they have been barred about six days before each launch.

Despite satisfaction with those limited closures, SOB leaders expressed concern about more frequent closures when Launch Pad 39B goes into use in 1986. Pad 39B lies within one mile of the beach road and NASA officials say they can't allow the public to get that close.

The SOB members took their complaints - and 5,500 petition signatures - to Baker at his Atlanta office in January. After months of debate, park service officials and SOB members agreed to a compromise in August.

Although they say they can't guarantee constant access to the beach, park service officials agreed to spend \$100,000



STS-5 Astronaut Activities during CDDT.

on an alternate access study - to be conducted by a local firm - and finish it by next summer if there are no budget problems.

Park service officials also promised that the public will be asked its opinion on alternate access and that Titusville Mayor Truman Scarborough will be kept up to date on all matters concerning Playalinda Beach. (TODAY, 9-24-82, p. 1B)

September 27: Poets, painters and journalists may be shipping out aboard the space shuttle by the late 1980s.

NASA has appointed a task force to decide who should get passenger seats aboard the \$10 billion spaceship. Writers and artists probably stand the best chance of hitching a ride.

"You want someone who can translate the thrill and elation into words so hundreds of millions can understand what it's all about," said James Kukowski, a spokesman for NASA headquarters in Washington.

Although 79 American astronauts have tried to describe the wonders of space flight, the results have been less than lyrical....

The NASA task force will meet next month at Johnson Space Center in Houston, and will submit a final report in February. The group is studying medical and training requirements for passengers, and possible legal problems if they were to die in a shuttle disaster.

"The biggest problem is who's going to be number one," said Kukowski. "Once it's started, it's going to be pretty hard to stop."

Shuttle passengers would probably have to pass the same physical tests taken by mission specialists. The exam requires at least 20/100 uncorrected vision, hearing loss not to exceed 35 decibels, and blood pressure no higher than 140 over 90.

Passengers will have to be between 60 and 70 inches tall. There is no strict weight or age limit, but candidates who were overweight or over 60 probably won't be accepted, Kukowski said.

Riding on the shuttle isn't nearly as strenuous as on early space shots. The G-force during launch and landing is no worse than an average roller coaster. Space sickness - the dizzying nausea induced by weightlessness -- would probably be the worst ordeal, Kukowski said. (THE ORLANDO SENTINEL, 9-27-82, pp. A-1 & A-6)

September 28: Kennedy Space Center workers Monday readied the shuttle Columbia for the next major test for its first operational flight on November 11 -- the loading of supercold fuel into the orbiter's external tank. A space agency spokesman said more than 500,000 gallons of frigid liquid hydrogen and oxygen propellant was scheduled to begin flowing about 5 a.m. today. After the fueling and a mock countdown and simulated blastoff, the propellants will be drained out of the tank and stored until reloading about five hours before the flight. (THE ORLANDO SENTINEL, 9-28-82, p. B-2)

<> A satellite that will provide international maritime communications thundered from its Cape Canaveral Air Force Station launch pad Tuesday night.

Workers on offshore oil rigs will get their telephone messages through the satellite -- INTELSAT 5 -- once it becomes operational in December, said Gavin Trevitt, spokesman for INTELSAT, an international satellite company.

The satellite is owned by 105 nations scattered on every continent, with users from Monaco to Vietnam.

The \$35 million satellite climbed through the clouds aboard a 134-foot-high Atlas Centaur rocket at 7:08 p.m.

The 4,348-pound satellite is the fifth of a new series of nine satellites linking telephone lines between borders. This latest satellite is the first to provide telephone service to commercial ships at sea and offshore drilling platforms from ground stations.

The maritime channels will be used by 37 countries.

"Everything from tuna boats to oil rigs will use it," Trevitt said. Aside from the maritime communications, the satellite will be capable of transmitting 12,000 international telephone calls and two television stations. (TODAY, 9-29-82, p. 14A)

September 29: Among thousands of requests for passenger seats America's Space Shuttle is one offering to exchange photos of Unidentified Flying Objects for guaranteed reservations.

The proposal came from two New Jersey men, who wrote officials at Kennedy Space Center that they would turn the pictures over to the Soviet Union unless the space agency took them up on the offer.

"It's quite a pitch, but I'm afraid we're going to have to turn them down," KSC spokesman Rocky Raab said laughing.

"I'll just send them the standard reply" which says there are no immediate plans to take civilians on round-trip rides aboard the space plane, he added....(TODAY, 9-29-82, p. 14A)

<> Primed with a half-million gallons of frigid rocket fuel, space shuttle Columbia staged a successful mock liftoff Tuesday.

An inspection team found no trace of frost or ice on the 154-foot external fuel tank. Falling ice was blamed for damage to several heat shield tiles on the shuttle during the third launch in March.

The Columbia is scheduled to blast off again November 11, carrying four astronauts and two communications satellites on its fifth trip into orbit.

Shuttle commander Vance Brand, pilot Robert Overmyer and mission specialists Joseph Allen and William Lenoir will fly the five-day mission. None of the men were in the shuttle during Tuesday's test.

Loading of the supercold liquid hydrogen and liquid oxygen began at 4:50 a.m. The fuel was drained soon after the simulated blastoff at 11:02 a.m. (THE ORLANDO SENTINEL, 9-29-82, p. B-2)

September 30: The Reagan administration plans to increase the budget for the military use of space by 10 percent a year to \$11 billion annually by 1987, a Defense Department official said Wednesday.

The official, who asked not to be identified, said the annual increases would support a projection by Edward Aldridge, undersecretary of the Air Force, that the government will be spending \$14 billion by 1988 on military space programs.

The increases reflect the administration's announced plan to give the 24-year-old space program a military orientation.

President Reagan announced in July a new policy committing his administration to preparing for military combat in space and the development of an anti-satellite weapon.

But most of the increases are going to the Space Shuttle, the primary vehicle for putting defense payloads in orbit, and expanding the network of 40 military satellites now in place for mapping, communications, navigation, spying and gathering weather data.

The administration budgeted \$6.4 billion for the Defense Department's space program this year and is seeking \$8.5 billion for fiscal 1983. By comparison, NASA's annual budget is now \$5.5 billion with \$6.1 billion sought for it next year. (TODAY, 9-30-82, p. 20A)

<> Former astronaut Jack Swigert said Wednesday he is being treated for bone cancer but will continue his campaign for a seat in the U.S. House.

"Apollo 13 taught me that challenges are to be met and overcome," Swigert said at a press conference with his physician, Dr. Bob Sawyer.

Sawyer said that Swigert had undergone surgery for a malignant tumor in his nasal passage several months ago. He said that the test for the bone cancer had been one of the last tests done when the astronaut entered a hospital last week for back problems.

More tests are being done to determine whether there is a link between the two malignancies, the doctor said.

Swigert entered Presbyterian Hospital in Denver for tests to determine the cause of back pain on September 16, two days after he won the Republican nomination in the new 6th Congressional District.

The doctor said Swigert has tolerated treatments so well he can continue his campaign for Congress against Democrat Steve Hogan of Aurora. Sawyer said Swigert will undergo drug therapy every three or four weeks and should not have any significant ill effects from it.

Asked about Swigert's prognosis, Sawyer said, "His chances are better than getting back from the moon in a broken spaceship. They are better than a flip of the coin."

Swigert said the reason he is continuing his campaign "is the optimism expressed by my doctors in the ability to control the cancer, and their judgment that I would be fully able to serve the citizens of the 6th District as their representative." (THE ORLANDO SENTINEL, 9-30-82, p. A-5)

<> It's not one of the more glamorous pieces of hardware in the space business, but the entire Space Shuttle rests on the broad back of a hulking, battleship-gray structure known simply as the mobile launcher platform.

Last week, as technicians were busy stacking solid rocket segments for the sixth shuttle flight, a group of NASA and industry workers took a little time to celebrate completion of a five-year project to convert one of the Apollo-era rocket perches for operational shuttle use.

The second mobile launcher platform, MLP No. 2, was formally turned over on September 30 to KSC's Vehicles Operation Directorate for operational use in the shuttle program. It will serve as the base from which Orbiter Challenger will begin its first orbital flight early next year.

Since 1977, the Design Engineering Directorate has been managing the extensive modifications required before the Saturn-era MLP could be used with the new, reusable Space Shuttle system.

"Everybody feels very good about it," said DE's Dave Wentworth, project engineer on MLP-2. "Everybody worked very hard on this and we're glad to see the task completed."

The project to convert the mobile launcher platform began in 1977. Work was underway on the first MLP, later to serve as the launcher platform for the initial shuttle flights.

Major tasks included removal of the Saturn-Apollo launch umbilical tower, reconfiguration from one to three exhaust vents and strengthening of the deck and remodeling of MLP systems. During most of the past year, work has centered on equipment hookup, checkout and validation, Wentworth said. Total project cost was about \$40 million.

MLP-2 is essentially identical to the first mobile launcher platform put into shuttle service. Modifications made to MLP-1 to resolve a solid rocket booster overpressure problem have been incorporated on MLP-2.

While the crews involved in readying MLP-2 for shuttle service are glad to see their work accomplished, the job of converting Apollo launch platforms for shuttle operations is not over yet.

Wentworth said work, aimed at completion in 1986, will begin shortly on modifications to MLP-3, which rests in a parking lot north of the VAB. (SPACEPORT NEWS, 10-15-82, p. 2, Vol. 21, NO. 21)

<> Just think: a rocket was launched into space, and you didn't pay for it. Space Services Inc. of America -- a Texas firm with only seven employees -- did it with a mere

\$6 million of investors' money. The company hopes to provide "low-cost, market-oriented" services with future operations. The Soviet Union and some Third World regimes have let it be known they don't like the idea of private space programs. Then again, they don't like the idea of private earth programs. (NATIONAL REVIEW, 10-1-82, p. 1189, Vol. XXXIV, No. 19)

OCTOBER 1982

October 1: KSC's Federal Women's Program Manager has been detailed to NASA Headquarters in Washington, D.C. to serve for four months as manager of the NASA-wide FWP.

Pat Lowry, manager of the KSC program since 1977, will be in the nation's capital from October 3 through January 20, 1983. "This is an opportunity for people in the field to understand how the equal opportunity staff operates at the Headquarters level," she said. "It's a great learning situation and a challenge for me."

Lowry will occupy the office immediately following completion of a four-month term by the FWP manager from Johnson Space Center. The Headquarters-level position, currently vacant, and the program manager in the field centers are intended to enhance opportunities for women in NASA. (SPACEPORT NEWS, 10-1-82, p. 6, Vol. 21, No. 20)

<> NASA's John F. Kennedy Space Center has awarded a \$1,742,850 extension of a current contract to the Federal Systems Division of International Business Machines Corporation, Owego, N.Y., to support the Space Shuttle program. The contract calls for IBM to manufacture and deliver one general purpose computer system for support of the Air Force Orbiter Functional Simulator at Cape Canaveral Air Force Station, by May 1, 1984. The cumulative value of the company's fixed-fee contract with the National Aeronautics and Space Administration to provide these services is \$2,114,091. (NASA NEWS RELEASE NO. 219-82, 10-1-82)

<> Kennedy Space Center firefighters avoided a strike late Thursday by extending the current contract with their employer Wackenhut Services Inc.

Union members approved the measure less than one hour prior to Thursday's midnight strike deadline.

The Transport Workers Union, representing 86 firefighters, inspectors and truck drivers, reached a stalemate Thursday afternoon after negotiating since August 16, said Frank O'Connell, Transport Workers Union international vice president.

At issue is Wackenhut's proposal to combine the firefighters' duties with that of the medical corps personnel in the event Wackenhut is named as the space center's chief base operations contractor later this month.

While union leaders are not fighting the base contract, they believe Wackenhut's proposed combination of firefighters and emergency medical technicians is going to cut jobs as well as costs.

However, union members voted "overwhelmingly" to extend their current contract until 15 days after NASA officially names the space center's new base operations contractor, O'Connell said.

During that 15-day period, Wackenhut and union representatives will meet to negotiate a new contract, which will be retroactive to October 1, he said.

"We must have a new contract at the end of that period," he added.

Federal mediator Richard Deem was called into negotiations Wednesday and Thursday. He said the union and Wackenhut are negotiating for a 27-month agreement.

Wackenhut officials could not be reached for comment Thursday night.

NASA officials had said they did not anticipate any delay in the November 11 launch of the Space Shuttle in the event of a strike.

"We would expect Wackenhut to step right in and do the job," said KSC spokesman Mark Hess. (TODAY, 10-1-82, p. 1B)

<> Funding for a fifth space shuttle orbiter was approved Wednesday by congressional conferees working on the 1983 federal budget, but the unnamed spaceship remained in limbo.

In Washington, the House-Senate authorization committee included \$85 million in start-up money for the \$1 billion orbiter. But a joint appropriations conference committee, meeting the same day, included no funds for the project.

The split decision left NASA officials bewildered but optimistic.

"It'll be a while yet before it's sorted out," said Philip Culbertson, NASA associate deputy administrator. "There's a reasonable possibility that we can get the fifth shuttle both authorized and appropriated."

To begin work on a fifth orbiter, NASA will have to shift money from its 1983 budget, or submit a supplemental request next year. Either way, it will require approval from the White House and Congress.

The battle for a fifth shuttle has dragged on for years in Washington. NASA and the Department of Defense say a fifth shuttle is needed as insurance in case the fleet suffers a breakdown or crash. The space agency also expects a big increase in demand for shuttle space after 1987.

Only four shuttles -- Columbia, Challenger, Discovery and Atlantis -- have been funded.

Challenger is scheduled to fly for the first time in January. Discovery and Atlantis will be turned over to NASA in September 1983 and December 1984.

"If we have a total inventory of four and one goes down, the remaining three cannot carry the workload," Culbertson said.

Unless work begins soon on a fifth shuttle, many shuttle contractors will halt production and shut down assembly lines. Resuming shuttle construction at a later date could drive the price up by hundreds of millions of dollars, NASA officials warn.

A private firm, Space Transportation Co. of Princeton, N.J., wants to pay for the fifth shuttle orbiter in exchange for marketing rights for the entire shuttle fleet. NASA will meet with the group this month, and is expected to pass judgment on the proposal by December.

If the plan is approved, Rockwell International might begin building the fifth orbiter sometime next year. The fifth ship, still unnamed, probably wouldn't be finished until late 1986.

Spacetrans employs only nine full-time employees, but will hire 60 to 100 workers by 1987 if NASA approves the proposal. A battery of insurance companies, banks and other financial firms will provide cash to buy the \$1 billion orbiter.

Meanwhile, NASA is in the strange position of trying to win government funding for a fifth orbiter, and also negotiating with private industry to buy the spaceship. Although the congressional action Wednesday did not ensure funding, space officials viewed it as a vote of support.

"We have not been told by Congress that we can start cutting metal, but having it authorized is a clear, favorable action," Culbertson said. (THE ORLANDO SENTINEL, 10-1-82, pp. C-1 & C-6)

October 2: The House approved and sent to President Reagan Friday night a bill authorizing nearly \$6.8 billion in the new fiscal year for NASA.

The measure, which cleared the Senate on Thursday, passed the House 284-83. It includes about \$3.5 billion for research and development and construction of facilities for the Space Shuttle, which recently completed its operational test flights.

It also earmarks \$85 million to begin construction of a fifth Shuttle vehicle and instructs the space agency to charge the Defense Department "such prices as necessary to recover the fair value" of launching military payloads. (TODAY, 10-2-82, p. 12A)

October 5: Robinson Equipment Company of Mims, a small business firm, has been awarded a contract by NASA valued at \$27,788.

The fixed-price contract calls for Robinson Equipment to deliver two Massey-Ferguson Model 275 tractors to the Kennedy Space Center by October 23, 1982.

The tractors will replace similar ones which have outlived their usefulness. They will be used for general grounds maintenance at the Kennedy Space Center. (NASA NEWS RELEASE NO. 222-82, 10-5-82)

<> Highly combustible chemicals that will power the Shuttle Columbia through space are to be loaded this afternoon as the spacecraft sits on its Kennedy Space Center launch pad.

Monomethyl hydrazine and nitrogen tetroxide are a volatile combination that fuel the Columbia's rear maneuvering engines and an array of small steering thrusters in the front and rear.

The propellants provide the necessary push for positioning the 122-foot-long spacecraft during flight and bringing it out of orbit at the end of the mission.

The Shuttle's fifth mission is still scheduled to start the morning of November 11.

Loading the chemicals is a four-day operation and all but essential personnel are cleared from the launch pad area.

The fuel loading requires the installation of protective bibs and buckets to prevent any chemicals from spilling down the side of the fragile spacecraft.

Playalinda Beach will remain open to the public during the operation. (TODAY, 10-5-82, p. 10A)

October 7: Space experts hope to launch interested Brevard students on careers in science or engineering through a new four-year program that will involve them in the front lines of the nation's space exploration activities.

NASA's Unique Resident Tutoring for Up-and-Coming Replacement Engineers--NURTURE--is ultimately an attempt to encourage young people, particularly women and minorities, to aim for a job at the space center, said J.A. Diggs, director of the KSC Equal Opportunity Program Office.

If approved by the school board next week, the Nurture project in January would recruit 20 ninth-graders to study NASA programs and learn about potential engineering-related careers.

Although details haven't been worked out, the plan is for students, accompanied by high school teachers, to visit the space center at least four times each year for demonstrations, tours, lab work and other activities, Diggs said.

They would meet astronauts and technicians, view a shuttle launch from the VIP site and learn about NASA projects.

After the inaugural group begins this school year, 10 ninth-graders are to be selected in each of the next three years. The program is set to conclude in 1989 when the fourth class graduates, but could be continued if it's successful, Diggs said.

Students would have the option of continuing in the program during their first year of college.

NASA and the school system are looking for "reasonably high achievers who show a particular aptitude in math and science," he said.

"The goal is to instill an interest in them to being good engineers...and, of course, to come and work for NASA," he said. "We feel the market is here and we're going to continue to need engineers."

In addition to visits to the Center, students are expected to work on projects on their own time under supervision of NASA officials. Students won't be graded on their work, but their interest should enhance their learning, he said.

"We're hoping their accomplishment as a result of this will be the real payoff, rather than grades," Diggs said.

Unlike another NASA program where high school students nationwide compete to prepare actual space shuttle experiments, the NURTURE students would develop projects for their own education, he said.

However, a school spokesman said it is possible that some of the out-of-school work could be submitted to school teachers for credit.

The applicant screening committee won't be limited to interviewing women and minorities, but officials believe that enough students will apply so that some can be included.

Currently only "a limited number" of women and minorities enter into engineering fields, he said.

"Typically minorities and women have not received the training and support for entering into a number of careers," explained Dr. Jane Chaney, director of secondary programs and assessment for the school board.

This program is an attempt to address that problem, she said.

Chaney and Diggs agreed that the recruiting program would be considered a success if only 50 percent of the students involved choose an engineering career....(THE ORLANDO SENTINEL, 10-7-82, pp. C-1 & C-5)

<> Astronaut Joe Allen won't have much of a view when the space shuttle streaks into orbit November 11.

"I'll be looking squarely at 20 metal lockers," said Allen, 45, who will ride below deck during the launch. "I have this terrible vision: I imagine the screws coming loose on all those lockers."

Astronaut William Lenoir, who will occupy the below-deck seat during landing, has similar fears.

"I guess I'm in charge of religious activity," jokes Lenoir, 43, who has been offered a blindfold by his fellow astronauts.

Despite complaints about the seating arrangements, the shuttle's four crewmen said Wednesday they were "99 percent ready" to fly the Columbia's fifth mission. The shuttle should achieve several milestones during the five-day voyage:

- * The first satellites carried into orbit and launched from the shuttle.
- * The first shuttle spacewalk.
- * The first U.S. spaceflight with four astronauts.

It will also be the first shuttle flight with no ejection seats. The two ejection seats used on earlier flights have been disconnected.

"The crew made it clear that they would never entertain the notion of ejecting and leaving two fellow crewmen behind," said NASA spokesman Jim Ball.

After four non-profit test flights, NASA also is eager to prove that the shuttle can make money. Telesat Canada and Satellite Business Systems of Virginia will pay about \$8 million each to have their 8,000-pound satellites carried by the shuttle.

The satellites will spring from the shuttle cargo bay on the first and second days of the mission, after receiving a computer command from the shuttle.

"It ought to be quite a sight as we see it leave the cargo bay," said Vance Brand, 51, who will command the 82-orbit voyage.

Brand, a veteran of the 1975 Apollo-Soyuz flight, is the only crew member who has been in space before. Pilot Robert Overmyer, 46, and mission specialists Allen and Lenoir are rookies.

Columbia will have 45 minutes to steer clear before the satellites fire separate rocket motors and travel to higher, geostationary orbits. The shuttle will be about 16 miles away when that happens, its belly toward the blast to prevent damage.

The shuttle's robot arm will not be making the trip. Instead, the satellites will be ejected by a turn-table spinning at 50 revolutions per minute.

Allen and Lenoir will attempt a 3 1/2-hour spacewalk on their fourth day aloft. They will lift weights with a small winch, and practice making electrical repairs on a make-believe fuse box.

Some of the space tools are custom-built, others were purchased at Montgomery Ward and adapted by NASA. A 50-foot safety cord will keep the astronauts tethered to the shuttle hatch while they roam the cargo bay.

Both astronauts have practiced the space repairs several times in a huge swimming pool at Johnson Space Center, but working in a frictionless, weightless environment could be far more difficult.

Before exiting the shuttle, Allen and Lenoir will spend 3 1/2 hours inside an airlock, wearing their space-suits, to avoid decompression sickness. Lenoir said he plans to "get some sleep" during the wait.

The spacewalk should determine whether future astronauts will be able to rescue a stricken "Solar Max" satellite that broke down in July 1980.

Although the shuttle is designed to carry up to 10 astronauts in an emergency, prior shuttle missions have used two-man crews.

During launch and landing, one astronaut has to squeeze between the pilot and commander in a "kiddy seat." Another crewman must ride below. (THE ORLANDO SENTINEL, 10-7-82, p. A-4)

October 12: Split-second timing is nothing new to NASA. The space agency has dazzled television viewers with precision flights for more than two decades.

But if timing aboard the fifth flight of Columbia, now set for liftoff November 11, goes awry, two satellites worth more than \$20 million each could be ruined by the sun's heat.

NASA and its customers, Satellite Business Systems (SBS) of McLean, Va., and Telesat Canada Ltd. of Ottawa, are confident that preflight planning will allow their 7,200-pound communications satellites to be put into orbit without a hitch.

If they don't, commander Vance Brand and pilot Robert Overmyer will have just five minutes to flip the Shuttle over on its back to shield the sensitive satellites from the heat.

That's only one problem. If the satellites stay in the shade too long they could freeze.

If necessary, mission specialists Joseph Allen or William Lenoir might be called upon to take a space walk to get the launches under way. (TODAY, 10-12-82, p. 10A)

October 13: While space agency officials are confident they can launch the Shuttle Columbia on time next month, their fingers are crossed in meeting the scheduled January 20 launch of Challenger.

The sixth Shuttle mission, with an advanced tracking satellite as its cargo, could be pushed back as much as a week because of main engine problems.

A pressure leak in one of Challenger's three main engines has delayed delivery from the National Space Technology Labs in Mississippi to Kennedy Space Center where Challenger is being prepared for flight. The engines were scheduled to arrive in Brevard late last month.

The three Rockwell International engines must go through a battery of tests before becoming certified for installation in the Orbiter.

"During some of the calibration tests, we were not satisfied and we did it again," said James Kukowski, a NASA spokesman in Washington, D.C.

So far, two of the engines have been certified after a 500-second test firing and they should be delivered to KSC by November 22 or 23, said KSC spokesman Mark Hess. The third should arrive a few days later.

A flight readiness firing of Challenger engines on the launch pad should be feasible by Christmas.

"It (a Jan. 20 launch) is still conjecture. We're aiming for it but it's going to be tight," Kukowski said.

The space agency wants to maintain the present launching schedule in the interest of gaining the confidence of Shuttle customers. Commercial satellite companies and the Department of Defense both demand Shuttle launch times that won't slip.

Once Challenger's engines are at the KSC Shuttle hangar, Hess said there should be no manpower problems getting them installed and tested.

"The same people who do engine work on the Columbia will do it on the Challenger," he said.

"As soon as we get a delivery, we should be on a more firm schedule," he added. (TODAY, 10-13-82, p. 10A)

October 14: Indonesian President Suharto took a close look Wednesday at the Space Shuttle that will carry satellites designed to unite his vast island nation.

Suharto, 61, took a less than two-hour tour of launch facilities at the Kennedy Space Center. His trip included an elevator ride 190 feet above Launch Pad 39A where Columbia remains poised for its fifth flight scheduled for November 11.

Two Indonesian satellites called Palapa, will be launched from the Shuttle in April 1983 and January 1984 and will provide telephone and television service between the nation's many islands.

For Suharto, who came to power in 1965 after crushing a communist coup, the sophisticated satellites may be a tool to bring the often divided country together.

While Suharto declined to be interviewed, he said in prepared remarks that the launch of his country's satellites "will allow Indonesia to become cohesive geographically as well as politically, socially and economically. Palapa is very important in trying to unify our country."

With 145 million people, Indonesia is the world's fifth most populous nation and is the size of Alaska and California combined.

The space center is "a historic place of great importance to the whole world," Suharto said through an interpreter.

"We promise we'll give your (satellite) hardware tender loving care when it gets to Kennedy Space Center," said KSC Director Richard Smith.

Greeted by NASA Deputy Administrator Hans Mark and Smith, Suharto and his party of 90 also toured the Shuttle firing room and the hangar where the Shuttle Challenger is being prepared for its first flight in January.

American hosts and Indonesian guests exchanged gifts that included a bronze model of the Shuttle from NASA. Suharto presented Smith with the Indonesian coat of arms, a

sculptured shadow puppet of a legendary Indonesian man who flies without wings, and a framed color photograph of Suharto and his wife.

The Indonesian president arrived at the space center's runway at 1 p.m. from Washington, D.C., where he had met with President Reagan on Tuesday. From KSC, Suharto went on to Houston's Johnson Space Center for a tour of mission control. (TODAY, 10-14-82, p. 16A)

<> America's Shuttle program can remain in civilian hands as long as funding for it continues to come largely out of the civilian space agency, said Hans Mark, NASA's deputy administrator.

In an exclusive interview Wednesday, Mark disagreed with those in Washington who say the Department of Defense (should) pick up a greater share of Shuttle costs.

Under the new Shuttle pricing policy, the Defense Department will continue to get a discount compared to commercial Shuttle users, but all Shuttle users will pay more in 1985 than they do now.

Members of the House Science and Technology Committee, like Rep. Don Fuqua, D-Fla., have recommended the Pentagon pay higher fees and more program costs since as much as 40 percent of the Shuttle flights through the mid-1990s will be exclusively military.

"Until it's fully operational, I'd like to see NASA retain control. The more the Department of Defense spends on the Shuttle, the less we (NASA) are able to control it," Mark said.

Mark, a former secretary of the Air Force, is at Kennedy Space Center today to honor space center employees at an annual awards ceremony.

He predicts the Shuttle fleet will eventually include as many as six Orbiters, with the last being bought by the Air Force.

Another subject close to NASA's heart is a space station. While a multibillion-dollar space station is still in the planning stage, Mark said there are plenty of reasons to justify building it.

And he predicted it won't be solely up to the Pentagon to decide if the country needs a space station. The scientific applications, including zero gravity manufacturing plants, and national pride may be factors.

"Apollo was almost purely for the hell of it -- just to show we're better than the Russians," he said.

Although the Soviet Union has been experimenting with an unmanned Shuttle-type spacecraft, Mark said Russia still has no manned re-usable space vehicle.

"They're thinking about one. The same logic that drove us, drives them," he said, referring to both countries' aim to make space more accessible for commercial and military uses. (TODAY, 10-14-82, pp. 1A & 16A)

October 15: The highest award of Federally Employed Women's Space Coast Chapter was presented recently to Claude E. Leslie Jr., chief of the Repro-Graphics Branch, NASA, at KSC.

Lounette Price, chapter president, said the Distinguished Service Award for 1982 was presented in recognition of policies, actions and leadership that have increased opportunities for women. In addition to meeting established criteria for the award, she said, Leslie has shown extraordinary support to the chapter and has helped it to achieve the goals and aims of Federally Employed Women.

Leslie, who has been with NASA for nearly 22 years, said, "I'm flabbergasted that they've selected me, particularly with such an impressive field to choose from. It's an award I'll cherish for the rest of my life."

FEW's aims include ending sex discrimination in government service, increasing job opportunities for women and furthering the potential of all women. (SPACEPORT NEWS, 10-15-82, p. 4, Vol. 21, No. 21)

October 18: A private company has decided to proceed with its plans to build satellite servicing and processing facilities here that will augment the National Aeronautics and Space Administration facilities, which are growing increasingly inadequate.

Astrotech International will start construction of its laboratory/assembly operation January 1, and expects to be in business a year later, according to Robert J. Goss, president. The company has been studying the facility's potential since last summer, when it was named Space Services International. The name was changed to Astrotech to avoid confusing it with Space Services, Inc., which is developing the Conestoga rocket.

Wertheim & Co. of New York City is heading a team of institutions providing \$5-6 million in venture capital for plant construction and long-term debt.

Astrotech will market a capability to provide facilities and engineering services for payloads, upper propulsion stage processing and storage. Initial capability is estimated at 30 spacecraft a year. (AVIATION WEEK & SPACE TECHNOLOGY, 10-18-82, p. 15, Vol. 117, No. 16)

October 19: The two satellites that will fly aboard the Space Shuttle next month were loaded and secured inside the Columbia's 60-foot-long cargo bay Monday.

The communications satellites will pop from Columbia's cargo bay into space November 11 and 12 during the Shuttle's first operational flight.

Each satellite, weighing about 8,000 pounds, was rolled into the cargo bay on a railing that led from a special room at the top of the launch pad to Columbia.

Once in their respective cradles in the cargo bay, the satellites were latched into place.

Shuttle engineers will spend today and Wednesday testing electrical connections between the satellites and spacecraft, said Mark Hess, NASA spokesman.

The first satellite, owned by Satellite Business Systems, will be launched into space about eight hours after the Shuttle lifts off from launch pad 39A.

A Canadian satellite -- called the Anik and owned by Telesat of Canada -- will spring from the cargo bay about 24 hours later.

A spacecraft motor in each satellite will be used to put them into orbit 22,300 miles over the equator. (TODAY, 10-19-82, p. 12A)

October 22: The Federal Systems Division of International Business Machines Corporation, Cape Canaveral, has been awarded a \$434,000 contract by NASA's John F. Kennedy Space Center.

The contract calls for IBM to conduct a study for further development of a computer software program which aids in automated planning and scheduling for Space Shuttle payloads. The study is to be completed by September 30, 1983. (KSC RELEASE NO. 245-82, 10-22-82)

<> The Air Force Space Division has made a decision to join NASA in a procurement effort which will eventually lead to selection of a single contractor for the processing of the Space Shuttle at both the NASA Kennedy Space Center and Vandenberg Air Force Base launch facilities.

NASA expects to issue a request for proposals for this joint effort in January, 1983.

Both NASA and the Air Force will consolidate contracts for flight hardware processing at both the Florida and California launch sites. At present, processing of Space Shuttle hardware is carried out at the launch site by several contractors who supply the flight hardware.

Originally, the Air Force had not defined a time to phase in the Shuttle Processing Contract at Vandenberg Air Force Base. It is now planned that the shuttle processing contractor will be phased into Vandenberg processing as early as practicable and will be assigned launch

responsibility in accordance with transition criteria. In accomplishing the phase-in, the shuttle processing contractor will work with the incumbent launch site contractor at the Air Force Base.

The new contract will result in significant cost savings during the operational era of shuttle. It will minimize interfaces at launch and landing sites and focus clear responsibility on a single contractor. This focus of responsibility should improve flight safety and mission effectiveness. (KSC RELEASE NO. 248-82, 10-22-82)

<> A rocket that can skip through the upper atmosphere like a flat stone on a pond may become another piece of reusable Space Shuttle hardware by the end of the decade.

The Orbit Transfer Vehicle would return to the Shuttle's lower orbit, and, using the atmosphere as a brake, would slow down from 23,000 mph to the Shuttle's speed of 17,000 mph.

Astronauts inside the Shuttle would maneuver the robot arm and pluck the Orbit Transfer Vehicle from space and place it into the 60-foot-long cargo bay for a return trip to Earth.

"It's a relatively expensive piece of hardware that should be built for retrieval and reuse. Instead of losing it, the only cost we'd have is to refurbish it," said Gene Austin, NASA engineer in charge of studying the concept.

By launching satellites with the reusable rocket, NASA could save the \$2 million to \$3 million it would otherwise spend to outfit each Shuttle with a new rocket.

The space agency selected two firms, Boeing Aerospace Co. of Seattle and General Electric Re-entry Systems of Philadelphia to identify the technology necessary in building such spacecraft.

Each of the contracts is valued at \$200,000. The studies began September 30, Austin said.

In one design, a balloon made of a ceramic fiber would inflate once the rocket has descended from high orbit to about 50 miles up. The balloon would act as a brake against the thin upper atmosphere before the rocket swings out into an orbit around the Earth at the Shuttle's altitude of 180 miles.

"It won't be captured by the atmosphere. The friction of the air against the vehicle provides enough drag to slow it down," said Austin, who added that such a maneuver would save fuel. That extra fuel could be used to increase the rocket's satellite-hauling capability.

The ceramic balloon would be made of a highly heat-resistant substance, like the Shuttle's exterior coat of tiles. Austin said it would have to withstand temperatures of up to 2,000 degrees.

Said Austin, "Flying in that part of the atmosphere is tricky. We don't have much history flying through there." (TODAY, 10-22-82, pp. 1A & 18A)

October 24: Despite a three-year downswing in Florida's tourist industry, local promoters are kicking hard at a sagging economy and a decline in international tourism to lure new tourism dollars and visibility to the Space Coast.

With the relaunching of America's space program, major cruise ship lines and a glimpse of the future just across SR 528, officials are hoping to bring 20 million visitors to Central Florida and the Space Coast this year.

With the dawn of the Space Shuttle era, Kennedy Space Center has become the third largest tourist draw in the state.

This year, KSC's Visitors Center is operating about 5 percent off last year's 2 million attendance figure, which was the Space Center's best year ever, said George Meguiar, KSC public relations manager.

Though KSC faces stiff competition from the economy and the 1982 Knoxville's World's Fair, the Space Center still enjoys a steady stream of international visitors. "If we're not

the number one preference in European markets, we're number two," he said. And that interest persists despite a recent decline in international tourists' buying power in America.

The center has completed about 35 percent of its expansion project, which will bring additional theaters and exhibit areas. And exhibits at the Visitors Center will be described in four languages beginning January 1. (TODAY, 10-24-82)

October 28: A towering Delta rocket cut a glowing swath through the night sky Wednesday propelling a state-of-the-art communication satellite into space.

The satellite, RCA SATCOM-5, will provide Alaska residents with improved long-distance telephone and television service.

The launch, from Cape Canaveral Air Force Station at 9:27 p.m., could be seen throughout most of the county. Careful observers could notice the burnout of the rocket's six powerful boosters that sent the spacecraft to a height of 8 miles in just under a minute.

Within three minutes after liftoff, the 116-foot-high rocket was at the edge of the Earth's atmosphere and still flying with propulsion from a second stage motor.

By early next week, SATCOM 5 will be operational and orbiting the Earth over the South Pacific at an altitude of 22,300 miles.

SATCOM 5 will provide several Alaskan television services including the Rural Area Network and an emergency medical network to isolated areas.

The satellite, the first to be bought by a state for its own use, will be owned by Alascom Inc., but RCA will maintain the spacecraft for its eight-year life.

The 2,385-pound SATCOM 5 also is the first satellite to use solid state transmitters, making them more reliable and durable.

Each of the 24 transmitters/receivers can relay two color television signals -- double the capacity of prior RCA SATCOMs. And a single transmitter/receiver can carry about 1,400 two-way telephone calls... (TODAY, 10-28-82, p. 20A)

October 29: The space agency has decided to abandon plans to rely on computers to guide the space shuttle Columbia to a "hands-off" landing at the end of its fifth mission beginning November 11, the agency reported Thursday /October 28/ in Washington.

Spokesmen said two landing simulators' lack of agreement on computer solutions for automated landing maneuvers was the key reason the automatic-landing test was called off. But the method may be used on a later flight. (THE ORLANDO SENTINEL, 10-29-82)

<> KSC's cargo officials agree that the first commercial flight of the Space Shuttle will mean the coming of age for the Space Transportation System.

Calling the fifth mission the "STS-1 of the cargo world," both John Neilon (CP) and Tom Walton (CO) recently contrasted launching cargo from the shuttle and launching it from an expendable booster.

Neilon said, "The main difference with Space Shuttle cargo is that the cargo must share space with other payloads. From processing and facilities scheduling to checkout people to actual room in the orbiter and crew interaction, the cargo customer must learn togetherness."

"The safety considerations also change considerably, both from the standpoint of protecting the launch vehicle and other payloads and in protecting a human crew as well. Those are things we've never had to worry about with expendables," Neilon said.

Walton agreed. "The orbiters are not only about four times as complex as an expendable rocket system, but have the capacity to carry vastly different kinds of payloads on the same flight. Our checkout procedures must be much more complex both on and off line to ensure everything is compatible," he said.

Both men agreed that there have been no significant problems during the checkout of the STS-5 cargo. The tests have proceeded with only the expected "growing pains" associated with a new system being used for the first time. The two attribute this smoothness to the professional approach taken by the various test teams.

Responding to recent news reports about a company which proposes to provide payload checkout facilities on a commercial basis, both Walton and Neilon welcomed the concept. "There could be a tremendous facilities crunch if the numbers of payloads increase as much as we expect," said Walton. "Cargo processing by a private concern would eliminate much of the congestion." Neilon added that the concept "would hold down our launch processing costs by not forcing us to update our checkout facilities over time."

On the commercialization of space itself, both men once again agree. Walton said, "I am eager to see the commercial aspect of space flight. We already have made great inroads in this area, and I see the practical, commercial usage of space taking a predominant role in the future."

This particular commercial payload has a special significance for Neilon. "I was the launch director for the first launch of a domestic, commercial communications satellite. Ironically, that was TELESAT 1, launched almost exactly ten years ago on November 9, 1972. It's a great thrill to be closely involved in this launch of a TELESAT 'bird' on the first commercial Space Shuttle flight," he said. (SPACEPORT NEWS, 10-29-82, pp. 1 & 6, Vol. 21, No. 22)

<> Some of the 270 were new to the annual presentation of awards for exceptional and faithful service. Others had stood to be recognized before, with other honors.

Some were recent additions to KSC -- while others were being thanked for 25, 35, even 45 years of service to their government.

The presentations cited exceptional service and achievement in such fields as engineering, science, administration, personnel, work methods, manufacturing techniques and other

space-related endeavors.../For a complete list of persons receiving awards see the issue of SPACEPORT NEWS cited below; a copy of the issue is on file in the Archives, room 1533, Headquarters Building, KSC, FL/ (SPACEPORT NEWS, 10-29-82, p. 5, Vol. 21, No. 22)

NOVEMBER 1982

November 1: An unscheduled hold of 5 minutes or more late in the countdown for the fifth space shuttle launch could cause a postponement of at least a day.

Subsequent shuttle missions also face this new countdown restriction, which results from the elimination of the anti-geyser line in the external tank to reduce weight. This move saves 600 pounds that can be added to cargo capacity, but it cuts the time in half during which a contingency hold can be called and not cause a postponement in the period from T-8 minutes 55 seconds to launch. There are no planned holds during this period of the count.

The anti-geyser line was incorporated in the first four mission external tanks to provide a circulation path to reduce the accumulation of gaseous oxygen in the feedline. It also was designed to prevent accumulation of liquid oxygen in the ullage area, which would rapidly reduce ullage temperature, reduce ullage pressure and could cause the liquid oxygen tank to collapse. (AVIATION WEEK & SPACE TECHNOLOGY, 11-1-82, p. 19, Vol. 117, No. 18)

<> Wackenhut Services, Inc., of Coral Gables, Florida, has been awarded a \$1,377,116 extension of its contract with NASA to provide protective services at the Kennedy Space Center.

Under the terms of the contract, Wackenhut is to furnish security, law enforcement and fire protection and rescue personnel at KSC. Wackenhut is also to provide plant protection and fire prevention programs for employees at the Center. The extension covers the period from November 1 to November 30, 1982.

Wackenhut has provided protective services at the Kennedy Space Center since 1978. The new award brings the total contract value to \$50,370,921. (KSC RELEASE NO: 30?-82, 11-1-82)

<> NASA's John F. Kennedy Space Center has awarded a \$1,060,000 contract extension to Reynolds, Smith and Hills, a Jacksonville architectural firm, for support of the Space Shuttle program.

Reynolds, Smith and Hills will provide design services for conversion of a mobile launcher used in the Apollo program to a mobile launcher platform that can be used for the Space Shuttle. The fixed-price contract stipulates that the design will be completed by August 31, 1983. (KSC RELEASE NO. 304-82, 11-1-82)

November 3: McGregor and Werner, Inc., of Washington, D.C., has been awarded a \$515,530 contract extension by NASA's John F. Kennedy Space Center to provide printing, publication and reproduction services for the Space Center. This extension brings the cumulative value of McGregor and Werner's contract with NASA to \$21,638,882.

The cost-plus-fixed-fee contract, which covers the period from November 1 through November 30, 1982, stipulates that McGregor and Werner will functionally manage printing, publication, reproduction, graphics, and microfilming and audiovisual operations for KSC. (KSC RELEASE NO. 310-82, 11-3-82)

<> NASA's John F. Kennedy Space Center has awarded a \$1,252,000 contract to David Boland, Inc., Titusville, Florida, for modifications to the Orbiter Processing Facility (OPF) where Space Shuttle orbiters are prepared for launch.

Work under the fixed price contract is to be done within 275 calendar days. The award was one that was set-aside for a small business firm. (KSC RELEASE NO. 306-82, 11-3-82)

November 4: NASA's John F. Kennedy Space Center has awarded a \$1,269,770 contract to the Holloway Corporation, a Titusville, Florida, construction firm, for support of the Space Shuttle.

The contract calls for the Holloway Corporation to construct environmental control system facilities which will be used for shuttle orbiters while they are being processed and readied for flight in the Orbiter Processing Facility at KSC. The Holloway Corporation will construct two equipment rooms which will house the system that will supply an air-conditioned atmosphere to ensure the environmental stability of the orbiter. Presently, a mobile environmental control system is used for the orbiter as it is transported from one place to another for processing. The contract provides for the work to be completed by September 30, 1983. (KSC RELEASE NO. 311-82, 11-4-82)

November 6: A \$30 million lawsuit charging NASA with negligence was filed Friday by a man who said he and four co-workers were sent into a space shuttle compartment filled with nitrogen gas.

Two men died and 27-year-old Nicholas Mullan claims the March 19, 1981, accident at the Kennedy Space Center left him with severe brain damage, sudden personality changes and other psychological disorders.

The lawsuit, filed Friday /Nov. 5/ in U.S. District Court in Orlando, claims that before the accident Mullan worked 50 to 60 hours a week on the space shuttle as a technician for Rockwell International. At night he went to school working toward an engineering degree. On weekends he served with the Army National Guard.

But that was before Mullan and four other Rockwell International technicians, after an all-clear signal, entered a compartment filled with nitrogen gas located just behind the shuttle's three main engines. Two men died and Mullan and two others were seriously injured.

Mullan and his wife, Denise, charged the United States, Pan American World Airways and Wackenhut Services Inc. with negligence. (THE ORLANDO SENTINEL, 11-6-82, p. B-1)

November 7: Ho-hum. Another Shuttle launch.

Although Brevard County students used to be shipped out by the busloads to watch past Shuttle launches, only one bus has been scheduled for a field trip to watch this Thursday's launch, said Nelson Rutledge, director of school transportation.

Some school officials say the lack of scheduled field trips to watch the event may indicate that Brevard students are getting used to the event.

"We're so far along...it seems like old hat now," Rutledge said. "I remember the first couple of launches -- there were a lot of requests. I'm a little surprised there weren't more requests this time. I don't know why there wasn't more interest."

The fact that Thursday already is a holiday for Brevard students because of Veterans Day and that the Shuttle launch is scheduled at 7:19 a.m. may have contributed to the lack of organized trips. (TODAY, 11-7-82)

November 8: The countdown toward Thursday morning's launch of Space Shuttle Columbia began without a hitch at 3 a.m. Sunday, as dozens of engineers and technicians responded to the "call to station" at Kennedy Space Center.

The Orbiter's electrical system was switched on, the 60-foot-long payload doors were closed and the pad cleared so the hazardous job of pressurizing the Columbia's on-board fuel tanks for flight could begin, said KSC spokesman Rocky Raab.

The pad was to be re-opened at 7 a.m. today so workers could begin preparations for filling the Shuttle's fuel cell reactant tanks with liquid oxygen and hydrogen, which will be converted to drinking water and electricity during the five-day flight.

The filling is scheduled to start about 7 tonight, followed by a built-in hold of eight hours beginning at 1 a.m. Tuesday. There are 20 hours and 19 minutes of holds set into the countdown.

Although the launch, scheduled for 7:19 a.m. Thursday will be Columbia's fifth, it will still be a first in many other ways.

It will be the first commercial flight as two companies -- Satellite Business Systems of McLean, Virginia, and Telesat of Canada in Ottawa, Ontario -- have paid NASA between \$8 million and \$9 million each to put their satellites in space.

It will feature the first spacewalk by Americans in almost a decade. And it will be the first Shuttle mission to carry four astronauts.

The four crew members are Vance Brand, Joe Allen, Robert Overmyer and William Lenoir.

Columbia is scheduled to land at Edwards Air Force Base, California, at 9:27 a.m. EST November 16. (TODAY, 11-8-82, p. 1A)

<> The obvious ideas are usually the most overlooked, and for that reason, you can probably appreciate what Merritt Island's Alfred McGee -- with help from his wife and two daughters -- has pulled off.

As 1982 heads into the home-stretch and the nation scrambles its brains for year-end gift ideas, one item likely to draw some attention is the 1983 edition of the "Space Shuttle Collection" calendar.

Complete with full-color NASA glossies of the Orbiter and its environment, calendar orders already have hit the 23,000 mark. Add that to the 52,000 copies of the 1982 edition, and you've got some calendars being moved. And the Christmas season won't hit its stride for another month.

"Sometimes," understated McGee, "it's the simple things in life that shoot off like a rocket. It was just a flat-out brainstorm."

During 12 years since 1967, McGee was an environmental control/life support system specialist at Kennedy Space Center. Anticipating the computer age, he shifted his sights to software and joined NASA's Digital Electronics Engineering Division. Yet, work that might blow the mental fuses of most people wasn't enough to sustain McGee. Something was missing.

"You look around and you see some of the great things that people have done to leave their mark, and you start to ask yourself 'What have you done?'" he mused. "You go, 'Well, gee, I don't know, but I'd like to do something significant.' It was nagging at me."

And suddenly, in early 1981, it became obvious: the Space Shuttle calendar. Fresh and unprecedented. Use NASA photos, which were public domain. Arrange said photos in linear fashion to create a sequential, storyboard effect. Accompany them with explanatory notation. Commemorate the significant dates in aerospace history, send them to a printing company and sell them for \$4.50 apiece.

"I wanted something that would tell people the story of the Space Shuttle, but I didn't want something like a book where you'd read it once and never look at it again," McGee said. "I wanted something you'd be aware of all the time...." (TODAY, 11-8-82, p. 1B)

November 10: Like the Space Shuttle program itself, the list of VIPs who'll see the 7:19 a.m. launch of Columbia Thursday /Nov. 11/ is downright business-like.

No longer is the NASA and NASA-contractor guest list for Shuttle launches headed by celebrities such as Robert Redford and Carol Burnett, but rather by the presidents, chairmen of the board and chief executive officers of Fortune 500 corporations; present and potential customers for the Space Shuttle; Shuttle contractors, a handful of former astronauts, an ambassador and lots of congressmen.

The best known names, perhaps, on the NASA list of "distinguished guests" released Tuesday are author James Michener, whose latest novel, "Space," is already on the best seller list; Bum Phillips, coach of the New Orleans Saints; and former astronauts David R. Scott, Richard Gordon, Thomas P. Stafford, Gerald Carr, Eugene Cernan, Donn Eisele and Donald K. (Deke) Slayton.

In Wall Street Journal circles, perhaps the most impressive names would be Frank Cary, chairman of the board of IBM Corp.; Frank McPherson, president of McGraw Hill Publishing Co., and Frederick W. Smith, chairman of the board of Federal Express Corp.

Heading the congressional delegation will be U.S. Rep. Don Fuqua, chairman of the House Committee on Science and Technology, who'll bring a group of about 35 or 40 congressmen and guests; U.S. Reps. Marilyn Bouquard, D-Tenn; Beverly Byron, D-Maryland; Glenn English, D-Oklahoma; L.H. Fountain, D-N.C.; William Green, R-N.Y.; Bill Nelson, D-Melbourne, /Florida/; Harold Hollenbeck, R-N.J.; Tom Harkin, D-Iowa; Frank Wolfe, R-Virginia; and John T. Myers, R-Indiana.

Former Secretary of Labor William J. Usery, Jr. is expected to attend, as is the Canadian Ambassador to the United States, Allen E. Gotlieb. Actor James Garner has been invited, but has not confirmed whether he will attend.

"The guest list this time is geared to industry, and potential and present customers for the Space Shuttle," said Arnold Richman, chief of Visitors Services, NASA Public Affairs. "For the upcoming Shuttle launches, it will depend on the payload. Like SpaceLab, for instance, that will be geared toward the Europeans who are involved."

Of the Fortune 500 corporations and companies on that distinguished list, about 180 will be represented at Thursday's launch, according to Richman. The list was put together by the American Society of Engineers, but the invitations were issued by NASA. (TODAY, 11-10-82, p. 1D)

November 11: Breakaway bolts have been replaced in the Space Shuttle's rocket booster apparatus and NASA is confident the valuable booster casings won't sink again as they did after last June's launch.

Pieces of a \$25 million pair of boosters are still rusting on the Atlantic Ocean floor where they sank minutes after the Shuttle's fourth launch.

"This time we've gone to two solid bolts and there shouldn't be any problem," said NASA spokesman Carl Jones.

Six parachutes are deployed to slow the boosters' descent to splashdown. In June, the chutes detached early, allowing the heavy steel casings to plummet back to the Atlantic.

Jones said the malfunction occurred when breakaway bolts that hold the chutes to the casings released too soon. The boosters "hit the water too fast and exploded," he said.

During the summer, the bolts were replaced with two solid bolts. (TODAY, 11-11-82)

- <> If Columbia launches on time today, its crew could have two "reasonably close" encounters with the Soviets' manned Salyut 7 spacecraft during the first four hours of flight.

The nearest approach would be 48 miles, perhaps close enough for the crews to sight one another if they are looking in the right direction and lighting conditions are right.

"We gave our astronauts no special instructions to wave out the window, but we expect the Russians will have some sensors on us to learn what they can about our machine," said Lt. Gen. James A. Abrahamson, NASA's associate administrator for space flight.

"We're happy to show it to them," he added.

With Columbia headed on a southeast course and Salyut moving north-northeast, the ships will close to within about 850 miles 10 minutes after the planned liftoff.

That will be over the middle of the Atlantic Ocean.

They'll drift apart, only to pass within 48 miles of each other at 11:16 a.m. high above the Indian Ocean. (TODAY, 11-11-82)

- <> At first glance, the fact that President Reagan hasn't yet witnessed a launch of America's most spectacular spacecraft seems like an unmistakable rebuff to NASA.

During the preparations for five launches, including today's liftoff, Reagan still hasn't had space on his agenda for Kennedy Space Center.

But putting it into historical perspective tempers that apparent snub of NASA. Of all the presidents commanding the nation's space program, only Richard Nixon watched a manned vehicle blast off during his incumbency.

Even President John F. Kennedy -- who viewed NASA as the salvation of the nation and strived to ensure its future up to his dying day -- never viewed a liftoff.

White House aides said Reagan hasn't been able to squeeze in the ceremonial task of witnessing a launch, but he hasn't ruled out the possibility for the future. (TODAY, 11-11-82)

<> As Shuttle Columbia touches down Tuesday on the California lake bed at Edwards Air Force Base, her sister ship Challenger will leave its cocoon at Kennedy Space Center's Orbiter Processing Facility for final pre-launch preparations.

Challenger, actually built before Columbia, will wheel to KSC's Vehicle Assembly Building to mate with its fuel tank, solid rocket boosters and mobile launch platform for its inaugural January 24 dash into space.

Challenger, which ferried to KSC atop a 747 jumbo jet in early July, was originally constructed as a "structural test article," said NASA public affairs official Brian Welch in Houston.

"The original idea was to build an Orbiter and shake it till it fell apart to see what it would take structurally," Welch said.

However, plans changed and Challenger was readied for operational flight.

Basically, the 75-ton Challenger is stronger, almost 25 tons lighter, and more stable than her forerunner.

"Columbia can take up to six vertical Gs, meaning how hard you can pop it on the runway when you land," Welch explained. "Challenger can take eight (vertical Gs)."

In the cockpit, Challenger will not use the ejection seats currently installed in Columbia but deactivated for the fifth flight.

Challenger's flight instruments also differ from Columbia's -- another transition from test development to practical operation.

Columbia's myriad sensors and measurement instruments have been replaced by mission support gear in Challenger like the Ku-band antenna system used to track satellites. (TODAY, 11-11-82)

<> The space shuttle Columbia and its crew of four were pronounced in "great shape" Wednesday for today's commercial debut of the space agency's billion-dollar flying machine.

This time, the fiery liftoff from the Kennedy Space Center will be only a prelude to the delivery of the spacecraft's first commercial cargo -- a \$23 million communications satellite that will be released as the shuttle passes over the Pacific Ocean at 3:18 p.m. today /Nov. 11/.

"The men are in great shape and the machine is in great shape," said Lt. Gen. James Abrahamson, the associate administrator of the National Aeronautics and Space Administration.

The only cloud over the whole schedule, in fact, appeared to be the vagaries of earthly weather.

"We expect great weather tomorrow," Abrahamson explained, beaming, under clear, sunny skies at mid-day Wednesday.

An hour later Abrahamson and scores of others were scurrying for cover as a cloudburst soaked the spaceport.

Rain was falling in California, too, where a fierce winter storm had already soaked the dry lake bed where the shuttle had been scheduled to land Tuesday after five days in space.

Officials said a landing on an all-weather, concrete runway at Edwards Air Force Base was still planned, but any new storm moving in from the Pacific Ocean could force NASA to keep the shuttle in space for a day or so more, waiting for better weather.

"We seem to have the only desert in the world that floods when we want to use it," Abrahamson noted ruefully. (THE MIAMI HERALD, 11-11-82, p. 1A)

November 12: The space shuttle Columbia and its four-man crew made America's first business trip into space Thursday /Nov. 11/ with a billowing, 50-mile plume of rocket exhaust behind them and a new era in the commercial use of space ahead.

Seven hours and 59 minutes after a "picture perfect" launch from Florida's Kennedy Space Center, the shuttle made its formal debut as the world's first space freighter and the astronauts made their first delivery -- a one-ton communications satellite shoved gently into space as Columbia sped toward the west coast of South America.

"We deliver," the crew reported to Houston's mission control center shortly after ejecting the satellite.

"We still have that beautiful satellite in sight; everything looks good," reported astronaut Joe Allen. (THE MIAMI HERALD, 11-12-82, p. 1A)

<> Only about 150,000 sleepy bird watchers lined the causeways and riverfronts for the space shuttle's fifth launch, the smallest crowd yet and considerably less than had been expected.

Missing, too, were the massive traffic tie-ups that have plagued previous launches. Although bottlenecks slowed progress on Merritt Island and the beaches, traffic was near normal in most areas within two hours after launch, police reported.

The Veterans Day parade on Merritt Island, which had been considered the biggest potential traffic problem, went off smoothly and on time at 11 a.m.

The small turnout was a surprise to business people who had been besieged by early motel reservation requests and were getting steady inquiries from southbound winter visitors.

The best guess earlier this week was 500,000, about the same number which showed up for the last launch. One enthusiastic chamber of commerce leader predicted a crowd of 750,000, but the Brevard County Sheriff's Department said Thursday only about 150,000 showed up.

Space center officials have predicted that interest in shuttle launches would lag as the space shots became more frequent. (THE ORLANDO SENTINEL, 11-12-82)

<> NASA Administrator James Beggs called Thursday's launch of the Space Shuttle Columbia "our best yet."

"We don't do them any better. The good Lord gave us a perfect day and we thought we'd better have a perfect launch," said Beggs, who watched the launch from the firing room at Kennedy Space Center.

"We were really pleased with how this one moved on," Beggs said. "When you move from an experimental stage to a commercial stage in anything, you worry. We have worried, but it has gone beautifully."

Besides being pleased with the successful beginning of the fifth Shuttle mission, "I was very pleased to see that we had the same number of accredited press this time. We had 1,500 last time and the same this time. Even though it's the fifth launch, they couldn't stay away." (TODAY, 11-12-82)

November 14: Part of the fun and excitement of helping cover a launch, such as the STS-5 launch Thursday /Nov. 11/, is meeting and talking to former astronauts who come back to experience part of the thrill of yesteryear missions.

Here are some astronaut footnotes to our coverage of the Columbia's beautiful launch Thursday morning.

Deke Slayton, the last of the original seven Mercury astronauts to retire, came to the launch as a civilian for the first time in the history of our space program. According to the handsome, graying former astronaut, he thoroughly enjoyed being there. In fact, it was his first visit ever to the VIP viewing site.

But, life is very different for Slayton than it was a year ago. Now, he's working for Space Services, a Texas company that hopes eventually to give the Space Shuttle some competition by taking civilian payloads into space. The company has so far produced two launches, one that blew up about a year ago, and one successful sub-orbital flight in September.

"About two years from now, we'll launch an orbital missile. We wanted to demonstrate (through the sub-orbital launch) to the government and to business and industry that it was possible and we did," said Slayton. "There's a lot of interest out there in what we're doing. It's sort of like the chicken and the egg thing. For them, it's if you've got the spacecraft, we've got the payload and for us, it's if we can get the payload, we'll supply the spacecraft.

"I'm enjoying being out of the military," he said. "There's no bureaucracy and no paper work. I can make a decision in 10 minutes and go do it. It's a refreshing atmosphere to be working in. The man I work for, David Hannah, is a real neat guy. He could have retired a long time ago, but wanted to see if this idea of his was feasible. No one wants to take a risk anymore. They've (most business and industry) become dependent on the U.S. Government. If they can't get a cost-plus contract, they don't want to do it."

Slayton went from one exciting event to another. On Saturday, he was the keynote speaker at the 50th anniversary celebration of the British Interplanetary Society in London. "When you count backwards 50 years and realize there was no space program then, you have to realize they were people with vision," said Slayton.

Slayton's last mission was in 1975 when he flew along with STS-5 Astronaut Vance Brand and Tom Stafford in the Apollo-Soyuz Test Project that linked in space American astronauts with Soviet cosmonauts. He was 51 at the time. Vance Brand is the same age now as he flies in Columbia's five-day voyage into space.

...Former Gemini 6, Apollo 8 and ASTP astronaut Tom Stafford was in town, too. A Lt. Gen. who served as Air Force Deputy Chief of Staff for Research and Development before his retirement, Stafford now is a partner in a consulting firm in Alexandria, Virginia. Stafford, Burke and Hecker, Inc., provides consulting services to billion dollar clients interested in the space business.

When Tom Stafford flew on ASTP, his representative in the Moscow Control Center was STS-5 Astronaut Bob Overmyer. "This is a special one (launch) for me, because of Bob," said Stafford at a pre-launch party hosted by Apollo 9 and 15 Astronaut David Scott at the Polaris International Club in Cocoa Beach.

"ASTP was my fourth and final mission," said Stafford. "But I can't complain. I flew four times on key missions and I was commander three of those four times. I am a three-star general. But, anything is anti-climactic after space."

...Friendly Ron Evans, one of everyone's favorite astronauts, said "I'd still be in the program if it weren't for the hiatus -- it was going to be five years before there would be another mission and that was just too long to wait. Plus, I was anxious to see how I would do in the business field. There's a certain age, like the early 40s, where you don't want to wait too much longer to get started in business. But if it hadn't been for that five-year hiatus, I'd still be in the program, believe me.

"I was lucky enough to be in the program when people could really relate to what we're doing. They could relate to going to the moon. I think it's tougher for people to relate to going around the earth. Now, if we get to the point where we have a space station out there, they'll be able to relate to that."

Does Evans feel the public is still interested in the space program. "It never ceases to amaze me," he said. "Whenever I make a public appearance around the country -- I do a lot

of speaking engagements for organizations totally uninvolved with the space program -- the place is always full. People want to meet me, find out what I'm doing these days. I'm not recognized on the street, of course, but if they know who I am, they're truly interested." (TODAY, 11-14-82, p. 1E)

November 15: Parachute recovery systems on both solid propellant boosters functioned as planned in space shuttle Mission 5, and the boosters came down about 140 miles off the Florida coast only 8 miles from the United Technologies Corp. recovery vessels Liberty and Freedom.

Mission 4 boosters sank in 600 fathoms off the Florida coast when parachute separation systems failed. The boosters were dragged to the bottom.

Mission 5 parachutes were released on ocean impact, and all six main parachutes were spotted shortly after. The boosters themselves rode high in a spar position with about 20 feet of each above water. The boosters and parachutes were scheduled to be returned to Port Canaveral by the afternoon of November 12. (AVIATION WEEK & SPACE TECHNOLOGY, 11-15-82, p. 21, Vol. 117, No. 20)

- <> Failure of command electronics on the Satellite Business Systems payload assist module threatened the schedule for launch of the fifth space shuttle mission and resulted in potentially harmful commands being sent to the satellite.

As a result of the malfunction, both the SBS and Telesat Canada payload assist modules had to be rewired in the payload bay to provide an extra measure of protection against recurrence of the problem in orbit. The rewiring was done with the orbiter positioned vertically on Pad 39A. (AVIATION WEEK & SPACE TECHNOLOGY, 11-15-82, p. 19, Vol. 117, No. 20)

- <> Launch countdown procedures for the fifth space shuttle mission were a replica of those used in the previous count in preparing systems for launch.

There were problems, but Robert B. Sieck, chief shuttle project engineer, said they were minor and well within the hold-time capabilities of being corrected.

"We want to see the procedures get more repetitious and mature -- but not routine," he said.

Alfred D. O'Hara, director of shuttle processing, called the Mission 5 countdown near perfect. (AVIATION WEEK & SPACE TECHNOLOGY, 11-15-82, p. 20, Vol. 117, No. 20)

<> Shuttle program goal of an operational space transport carrying paying cargo and multiple passengers became reality November 11 as the orbiter Columbia flew its fifth launch ascent using procedures now being standardized for the vehicle.

The shuttle's liftoff weight for its first operational mission was about 14 tons heavier than on its initial flight, reflecting provisions for a four-man crew and the Satellite Business Systems and Telesat Canada spacecraft cargo. Ascent procedures used by astronauts Vance D. Brand, Marine Colonel Robert F. Overmyer, Joseph P. Allen and William B. Lenoir will be the standard for most future flights, thus simplifying crew training and smoothing reusable space transport operations.

The launch represented the first time in U.S. or Soviet manned flight history that four crewmen were launched at the same time. Lenoir flew in a cockpit jumpseat position while Allen rode in a seat in the orbiter middeck.

The ascent trajectory was slightly depressed because of 70-kt. headwinds. The night before liftoff, shuttle management was somewhat concerned that the winds at 40,000 feet would have an unacceptable cross component on the vertical stabilizer. Analysis showed no flight safety problems, however.

Columbia's fifth ascent also differed from its previous launches in several areas because of both revised solid rocket booster and abort capabilities and the spacecraft's heavy liftoff weight. The Mission 5 liftoff weight target of 4,494,556 pounds is over 5,000 pounds heavier than Mission 4 and about 28,000 pounds heavier than on shuttle's first flight.

Main engine throttle-down profile used to slow vehicle acceleration during the period of maximum dynamic loads as Columbia approached Mach 1 differed markedly during this launch compared with earlier flights.

About 33 seconds into the climbout, the three Rocketdyne engines were automatically throttled down to 85% thrust compared with the earlier 68% throttle-down level originally planned for Mission 5. The 68% would have been more like that used on all the previous flights.

The need to maintain higher main engine thrust levels resulted from a determination that the United Space Boosters /Thiokol solid rocket motors have slightly less performance than calculated earlier. With less performance from the solids, the vehicle had to use somewhat higher thrust levels from the main engines to hit the desired velocity, altitude and dynamic pressure targets at Max-Q, the point of maximum aerodynamic loads.

The heavier vehicle weight also was a factor in maintaining higher main engine thrust levels during the throttle-down period. (AVIATION WEEK & SPACE TECHNOLOGY, 11-15-82, p. 18, Vol. 117, No. 20)

November 16: In a remote southwest corner of the Kennedy Space Center, physically isolated from the mainstream of KSC activity and unseen by most employees, the round eyes of four large dish antennas constantly scan the heavens. Originally code- designated "MILA," for Merritt Island Launch Annex, the call sign of this tracking station has endured since 1965, when it was built to support the Apollo-Saturn program.

MILA currently stays busy supporting numerous scientific spacecraft, including the Solar Maximum Mission, ISEE-1, Nimbus VII, Landsat IV, and both Dynamic Explorer spacecraft. Its past credits include support of both Viking missions to Mars and the two Voyager missions to Jupiter and Saturn.

MILA is called the "launch station" when it receives data during the early phases of the Space Shuttle or Atlas-Centaur and Delta flights. Part of NASA's worldwide Space-flight Tracking and Data Network (STDN) system, it is

managed by the Goddard Space Flight Center and operated by Bendix Field Engineering Corporation. A total of 127 personnel staff the station 24 hours-a-day, seven-days-a-week.

The computers and other equipment at MILA provide uplink/downlink voice, telemetry, commands, data and television for the Space Shuttle. Domestic satellite relay equipment forwards these transmissions to Mission Control or other NASA Centers.

In addition, MILA is responsible for the operation of a smaller tracking station at Ponce de Leon Inlet, which is active only during Space Shuttle launches. The exhaust plume from the solid rocket boosters hampers Shuttle communications at KSC from T+1:00 to T+2:00. The Ponce de Leon station can "see" the Shuttle from a side angle, to fill this one minute communications gap.

Other equipment recently installed at the MILA site are antennas to communicate with two Tracking and Data Relay Satellites (TDRS), which will be launched next year on STS-6 and STS-8. In the future, spacecraft that are to use the TDRS system will be in contact with it through MILA while still on the ground, to verify compatibility before the launch. This includes the Space Shuttle.

The TDRS system can relay data from any satellite below geosynchronous altitude (22,240 miles above the equator), providing coverage for about 85 percent of most such orbits. This will replace most of the usual tracking from ground stations, which can provide support only when a spacecraft is within sight.

The Goddard STDN system, of which MILA is a member, will continue to provide tracking for satellites with highly elliptical orbits. These have an apoapsis, or high point, beyond the geosynchronous orbit of TDRS. An example of such a satellite is ISEE-3, with an orbit that has extended up to 900,000 miles from Earth.

The future for the MILA tracking station is a bright one. Because the TDRS system cannot relay Space Shuttle communications until T+8 minutes, after external tank separation, it will continue to function as the launch station for the Space Shuttle. The Delta and Atlas-Centaur vehicles are not TDRS-compatible, and MILA will serve them also.

During the fall of 1983, equipment from the Jet Propulsion Laboratory will be installed at MILA to support the Delta launch of the Active Magnetospheric Particle Tracer Explorer (AMPTE) spacecraft in 1984. This same JPL equipment will be used again for the Galileo Jupiter Orbiter/Probe and the International Solar Polar Mission, both scheduled for launch aboard the Space Shuttle in 1985.

During a period when other stations are cutting back to part-time or reduced hours operations, MILA continues to be a full-time 24-hour tracking facility. (SPACEPORT NEWS, 11-16-82, p. 2, Vol. 21, No. 23)

November 18: While the never-before-flown Shuttle Challenger is scheduled to move from its hangar to the Vehicle Assembly Building at 6 a.m. Saturday, the veteran spacecraft Columbia came home to rest Monday afternoon.

The Columbia, which completed its fifth flight Tuesday, will be flown back to Kennedy Space Center by 12:30 p.m. Monday from Edwards Air Force Base in California, hitched on top of a 747 aircraft.

The 100-ton Columbia will get a major overhaul in preparation for its next flight in October 1983. On that mission a crew of six will crowd into the spacecraft and the European Spacelab will occupy the 60-foot-long cargo bay.

The move of the Challenger from its hangar has been delayed four days because of engineering tests. It will make its maiden voyage on the six Shuttle mission scheduled for January 24. (TODAY, 11-18-82, p. 16A)

<> The world's heaviest communication satellite, weighing 3,000 pounds more than the conventional variety, will take center stage in Space Shuttle Challenger's cargo bay.

The sixth Shuttle mission, now set to start with a January 24 launch from the Kennedy Space Center, will mark the beginning of a new generation of spacecraft.

The Tracking and Data Relay Satellite (TDRS) the Challenger will carry into space is part of a satellite system designed

to give engineers on the ground an around-the-clock link with future Shuttles.

After a second TDRS is deployed in July, the system should provide continuous voice and computer data transmission between Shuttle astronauts and Mission Control.

Because the satellites will orbit the Earth at 22,000 miles up, their signal will cover a wide area of the globe, keeping an electronic eye on both the Shuttle and a White Sands, N.M., tracking station.

Once the system is fully working, late next year, computerized information or astronaut voice signals will be beamed from the Shuttle -- at only 160 miles up -- to a TDRS. That signal will be beamed to the White Sands tracking station.

The White Sands station is a state-of-the-art information gatherer -- it could receive every letter and punctuation mark in a 140-volume encyclopedia every second, said Neville Barter, a spokesman for TRW, the satellite's manufacturer.

While the present array of ground stations scattered around the world in the Shuttle's patch can track about 15 percent of the spacecraft's orbit, two 5,000-pound TDRS's will raise that coverage to 85 percent, Barter said.

Harris Corporation, headquartered in Melbourne, manufactures the two 16-foot-wide gold antennas that unfold from the TDRS like umbrellas once it's deployed.

Aside from TDRS, the Challenger also will carry into space a powerful upper stage rocket designed to boost the satellite into its high-Earth orbit -- a tenth of the way to the moon and far beyond the Shuttle's reach. Four astronauts will fly the three-day mission, and they are expected to deploy the TDRS from the cargo bay only about eight hours after liftoff.

A Japanese snow-making experiment that will study zero-gravity crystal growth and a U.S. Air Force Academy canister of metals-processing instruments also will hitch a ride in the cargo bay. (TODAY, 11-18-82, p. 16A)

- <> Two Brevard businessmen, a Milwaukee man and their companies -- all accused of inflating or falsifying the costs of construction work at NASA - finished the second day Wednesday of what could be a six-week-long fraud trial in federal court.

The trial stems from a 20-count indictment issued in January against the men and their firms, which were doing subcontracting work at Kennedy Space Center. Federal prosecutor Ed Tomko of Washington, D.C., said the men inflated labor and equipment rates among other expenses in four years ending in 1979.

The men and companies accused are Arthur Boschen of Titusville, president of New World Construction Co.; James White Jr. of Melbourne, a former New World engineer; and Philip Akwa of Milwaukee, president of Capital Communication Corp. (TODAY, 11-18-82, p. 1B)

- <> Critics of the sale of oil and gas leases off the Florida coast are enlarging on their complaints about possible dangers to the state's tourists and fishing industries.

They are joining in a warning by NASA that oil rigs along part of the Atlantic coastline could be endangered by booster rockets, fuel tanks and other falling debris from the Space Shuttle.

NASA wants the flight-clearance zone for Kennedy Space Center eliminated from the area the U.S. Department of Interior wants to open up for oil and gas exploration.

Some offshore-drilling opponents in six Florida coastal counties that would be affected, including Brevard, are considering whether to join NASA in its petition.

Brevard County Water Resources Director Bob Massarelli said his office is now reviewing the Department of Interior's environmental impact statement on the offshore leases but has not yet decided whether to recommend that Brevard join the opposition.

The matter probably will be brought before the county commission at its December 2 meeting, Massarelli said, before the scheduled December 7 public hearing on the leases in Daytona Beach. Massarelli said the extent of Brevard's participation in that hearing will depend on the commission's decision.

Massarelli previously has voiced concern about the "onshore" impact of the offshore drilling, saying the program would bring an influx of new workers to the area and strain current water resources.

Volusia County Council members will debate the issue at a council meeting in DeLand today.

Some officials in the other counties and from Governor Bob Graham's office have complained that offshore rigs would endanger the state's important tourist and fishing industries. One of the biggest fears is oil spills along the tourist beaches.

NASA's proposal would cut about a third of the 33 million acres of Atlantic Ocean bottom that Interior Secretary James Watt wants to open up for exploration in July.

NASA's flight-clearance zone extends from 12 to 130 miles offshore in an area stretching from Cape Canaveral north to near Brunswick, Georgia. It is off the coasts of Volusia, Brevard, Nassau, Duval, St. Johns and Flagler counties. (TODAY, 11-18-82, p. 1B)

November 19: NASA's John F. Kennedy Space Center has awarded a \$2,438,250 contract modification to the Federal Systems Division of International Business Machines Corporation, Cape Canaveral, Florida, for support of the Space Shuttle program.

This award is for additional services under an existing cost-plus-award-fee contract with IBM to provide systems engineering and software development services for the Launch Processing System (LPS) at KSC. This contract modification calls for IBM to develop techniques that will aid LPS users in developing applications software for a multi-flow, multi-vehicle environment and increasing launch rates.

IBM provides the detailed design, development, validation, configuration management, and maintenance of the LPS system software, which provides programming instructions to the sophisticated computer system used in the automated checkout and launch of Space Shuttle vehicles from KSC.

This contract modification is for the period from July 1, 1982, through September 30, 1983, and brings the cumulative value of the parent contract to \$88,352,204. (KSC RELEASE NO. 318-82, 11-19-82)

November 21: Seven of 10 Americans think the Space Shuttle program is a good investment for the country, according to a new Associated Press -- NBC News poll.

A majority also said they think the government is spending the right amount or not enough on the space program.

A plurality said the main purpose of the space program should be scientific exploration rather than national defense.

And the 1,583 adults in the nationwide telephone poll Monday and Tuesday were almost evenly divided over whether they would travel in outer space themselves if they had a chance. Men, however, were much more likely than women to say they would take a space flight. (TODAY, 11-21-82, p. 1A)

November 23: Philip E. Culbertson, who has been assistant for Space Transportation Systems in the Office of the NASA Administrator since 1979, has been named associate deputy administrator of the agency and given a special assignment to direct planning for development and operation of a U.S. manned Space Station or Space Platform.

In moving to the number three position in the agency, Culbertson succeeds Robert F. Allnutt, who has served in the post since mid-1978.

Allnutt, an attorney with an engineering degree, has been appointed to the newly-created position of deputy general counsel for policy review, where he will be responsible for

conducting a series of reviews of "the legal implications of major policy areas....." (DEFENSE DAILY, 11-23-82, p. 118, Vol. 119, No. 15)

<> Merritt Island homeowners have taken another step toward preventing the manufacturers of the Space Shuttle's solid rocket boosters from building a booster cleaning plant on the island.

Merritt Island Executive Council Inc. officials, representing 18 homeowners associations, voted at their meeting last week to voice their disapproval of the proposed United Space Boosters Inc. plant site to NASA's Kennedy Space Center Director Richard Smith.

Executive Council President Jerry Shaw said he expressed that disapproval in a letter sent to Smith.

USBI announced in February tentative plans for an off-site plant for non-launch activities. Based at KSC, USBI has since leased 140 acres near the barge canal and obtained a conditional use permit to store hazardous waste on the site.

"The letter's purpose is to convince NASA that the proposed site is not the right place for the facility. We do not want it here," said Shaw, a lieutenant colonel at Patrick Air Force Base, employed by the Department of Defense Space Shuttle Support Systems Plans Division.

NASA officials say they haven't received the letter and Smith will be unavailable for comment until Wednesday at the earliest.

The homeowners' biggest concern is the hazardous chemicals that will be stored at the facility if it is established, Shaw said.

"In the event of an explosion you have an established residential area nearby that might be impacted," he said. "Then there's the risk of pollution and contamination."

USBI Deputy of Florida Operations Beauford Franklin and other company officials at KSC were unavailable for comment.

Franklin is scheduled to meet December 8 with the East Merritt Island Homeowners Association.

The chemicals would be cleaning fluids used to remove any fuel residue from rocket segments before they're shipped out of state for refurbishment, USBI spokesman Rick Smith said last week. Most of the wastes involved would be methane chloride -- used by dry cleaners -- and concentrated citric acid, he said.

Cape Canaveral Air Force Station now is where segments of the rocket boosters are cleaned, said NASA spokesman Hugh Harris.

Shaw said homeowners decided to send the November 19 letter to NASA's Smith because briefings received by the council from USBI established that NASA has the final decision on the facility's establishment and location.

NASA officials still are analyzing the situation and don't know that they would have the final say, according to NASA spokesman Rocky Raab. The USBI contract is administered by Marshall Space Flight Center in Alabama -- not KSC, Raab said.

Shaw said he first brought the proposed plant to the attention of Sue Ford, president of the East Merritt Island Homeowners Association, when he saw USBI's application for a conditional use permit on the county Planning and Zoning Department agenda.

An East Merritt Island Homeowners Association newsletter distributed earlier this month carried an article saying that USBI will store "hazardous waste" on land along the barge canal between Hall Road and SR3.

"Not true," said USBI's Smith in response to the newsletter.

He said the firm will not store hazardous wastes on the Merritt Island site -- if such a site is chosen.

Wastes instead would be stored temporarily -- up to 30 days -- before being removed from the premises, Smith said. All wastes will be disposed of by a federal and state licensed contractor, he said.

USBI hired local engineers from Stottler, Stagg and Associates to prepare site evaluations and plans for a proposed Merritt Island plant. No information on preliminary architectural plans or proposed infrastructure have been made available by the company or the architectural firm.

Engineer Malcolm McLouth, in charge of the project, was unavailable for comment as he is out of the country.

A rough-draft map of the proposed site shows 200 acres bordered on the east by NASA property, unused land on the west, Madison Avenue on the north, and a barge canal access to the south.

USBI's Smith stressed the Merritt Island plant is only one of several alternatives. There are no other Brevard County sites being considered, Smith said. But additional space for USBI might be found on undeveloped KSC property, he said. (TODAY, 11-23-82, p. 2B)

<> Space Shuttle Columbia, hitched to the spine of a 747 aircraft, made an early return to Kennedy Space Center Monday afternoon.

Columbia was to be moved into its hangar around 6 a.m. today -- 2 1/2 hours after Shuttle Challenger was to be towed out of the hangar and into the Vehicle Assembly Building. Challenger, which will be flown in January on the next mission, has had some trouble getting out of the gate because of faulty hydraulic lines in a landing gear.

The former United Airlines 747, with its valuable cargo on top, touched down in a trail of dust at the space center's three-mile runway at 12:14 p.m. About 200 space center employees and their families braved the mosquitoes and crowded onto a small field near the runway in what's become a high-tech bird-watching tradition.

"It doesn't get old to me. I'm still as excited as the first time," said Velma Keene of Satellite Beach, who came equipped with a lawn chair and camera.

Although Columbia looks a bit worn, it still has a long life ahead, said Bill Williams, Columbia vehicle manager.

"It's beginning to look like a used spacecraft, like the ones in the Hollywood movies -- like 'Star Wars,'" Williams said.

The double-decker flying machine of 747 and spaceship left Kelly Air Force Base near San Antonio at 9 a.m. after pilots found clear weather along the 1,200 mile path to Florida.

The decision to fly was made an hour before takeoff.

A storm front Sunday in the Texas area had threatened to delay the flight as much as two days. Sunday morning, the Columbia-747 duo left Edwards Air Force Base, California, where the Shuttle ended a five-day mission November 16.

With five flights under its belt, Columbia will be retired for nine months before its next flight -- carrying Spacelab and a crew of six into orbit.

John Young, commander of the first Shuttle flight in April, 1981, will sit in that seat during the Spacelab mission.

Modifications to the spacecraft include greater accommodations for the bigger crew, a small kitchen, installing the barrel-shaped Spacelab and more powerful main engines.

Williams said he is confident Columbia will be flight-ready.

Columbia's major problem on the fifth flight was damage to the left main brake upon landing at Edwards.

"It locked up the last 50 feet or so of rollout, scuffed the tire and caused a leak," Williams said. But he added that a modification of the braking system will be made.

Late Monday afternoon, Columbia was gingerly hoisted from atop the 747. From there, Columbia was to be towed to its hangar.

Challenger will carry satellites into space for the next three Shuttle missions through October 1983. (TODAY, 11-23-82, p. 1A & 12A)

November 26: They are esteemed workers at all times -- but for several days before and during the launch of STS-5, they were given special honors and privileges.

The KSC Civil Service and contractor employees were the latest group of launch honorees to be recognized for their outstanding and individual contributions to the space program.

The honorees were guests of honor at a reception held at the Visitors Center, giving them a chance to get acquainted with NASA Administrator James Beggs, KSC Deputy Director George Page and several members of NASA's astronaut corps.

Following a special tour of Launch Complex 39, they were treated to a VIP site view of the fifth mission of the Space Transportation System.

The following are the employees commended for their dedicated service to the nation's space program.

NASA: Mark Schlomer, Clarence Lasure, Karon Witcomb, Norman Carlson, Thomas Feaster, Shirley Green, James Lane, Bill Study, Vincent Guttuso, Ralph Rice, Captain Edward Serine.

The Bionetics Corp.: Mark Provancha, Dieter Schiefner.

Expedient Services, Inc.: Jessie Walls, Sr.

IBM Federal Systems: Thomas Akridge.

Martin Marietta Aerospace: John Thompson.

CCMS Production Operations, Martin Marietta Aerospace: William Nixon.

McGregor & Werner, Inc.: Sandra Burris.

Planning Research Corp.: Bemis Tatem, Jr., Suzanne Bassett, John Smith, Jr., Ernest Tholke.

TWA Services, Inc.: Ella Stucky.

Unified Services, Inc.: James J. Washington.

United Space Boosters, Inc.: Grant Witters.

Wackenhut Services, Inc.: Lillian Stubbs.

Wiltech Corp.: Thomas Owen.

Computer Sciences Corp.: Marguerite Law, James Ward, Jr., Thomas Eastham.

Rocketdyne: Barbara Cisco.

Rockwell International Corp.: Lawrence Mullen, William Cheatham, Jr., Theresa Clover, Linda Beck, Walter Antoniewski, Harold O'Dell, Calvin Rose, Forrest Rooker.

Boeing Services International, Inc.: Arthur Gordon, Marilyn Dunfee, Murin Whitener, Adelbert DeWees, Robert Osborne, Anne Pantano, Stanley Starr.

McDonnell Douglas Technical Services, Co., Inc.: W.L. Robinson, Wendy Dankovchik.

Pan American World Airways, Inc.: Joanne Helton.
(SPACEPORT NEWS, 11-26-82, p. 1, Vol. 21, No. 24)

November 29: Space shuttle workers here moved the orbiter Challenger to the Vehicle Assembly Building November 23 to mate it with the external tank and solid rocket boosters in preparation for its first space flight and the sixth in the shuttle series.

A number of minor problems in cockpit systems and main landing gear hydraulics delayed the move that had been planned for November 17. (The) National Aeronautics and Space Administration wants to stack the shuttle system and move it to the launch pad November 29 for a flight readiness firing of its three main engines before Christmas. A date of December 21 is the target for this firing.

The main engines had been a pacing item in the schedule. The third engine completed its 500-second test at National Space Technology Laboratories in Mississippi, October 31. It arrived here November 10, shortly after the liftoff of the orbiter Columbia on its fifth mission. These engines are qualified at 104% of rated thrust. Engines in Columbia

are qualified at 100% thrust, which is 375,000 pounds each at sea level. (AVIATION WEEK & SPACE TECHNOLOGY, 11-29-82, p. 72, Vol. 117, No. 22)

<> NASA has selected EG&G, Inc., of Wellesley, Massachusetts, for negotiation of a contract to support base operations at the Kennedy Space Center.

The cost-plus-incentive/award fee contract will be for an initial period of one year, plus two priced one-year options and seven unpriced one-year options, for a total potential period of 10 years.

EG&G's proposed cost for the initial three-year period is approximately \$193 million.

The base operations work contract will be the first of three comprehensive contracts to be awarded to strengthen the Space Transportation System launch function. The contract will consolidate institutional and certain technical support services now provided by 14 different contractors into a single mission contract covering utilities, facilities, administrative services, technical operations and health and safety services.

EG&G, Inc., proposes to utilize a work force predominantly composed of employees of incumbent contractors currently performing the same or similar work at Kennedy.

The contractor will also establish and maintain a retirement benefits plan that will be transferable to any future successor contractor. This is a unique feature, requested by NASA, which is intended to stabilize pension opportunities for base operations contract employees. The contractor also proposes a significant goal for small and small disadvantaged business opportunities.

Requests for proposals were originally mailed to 48 companies and 69 additional companies requested copies of the RFP. In addition to EG&G, Inc., proposals were also received from:

* BENKO Joint Venture (Bendix Field Engineering; Wackenhut Services, Inc.; Planning Research Corp.; and Computer Sciences Corp.), Cape Canaveral.

* Boeing Services International, Cocoa Beach.

* Lockheed Engineering and Management Services Co., Inc., Houston. (SPACEPORT NEWS, 12-10-82, pp. 1 & 6, Vol. 21, No. 25)

<> (The) Interior Department has refused to exclude about 10 million offshore acres of the Atlantic Ocean floor from oil and gas exploration despite a National Aeronautics and Space Administration plea that it needs this area for space shuttle operations. The area NASA wants excluded is fan-shaped and extends to a maximum distance of 195 nautical miles from the Kennedy Space Center. (The) lease of approximately 33 million acres of Atlantic ocean floor from 28-37 degrees North Latitude has been proposed for next July by Interior Secretary James Watt. NASA is protesting that the zone it wants excluded includes the normal drop area for recoverable solid rocket boosters and that the external tank could be jettisoned there in a launch abort. (AVIATION WEEK & SPACE TECHNOLOGY, 11-29-82, p. 15, Vol. 117, No. 22)

November 30: EG&G isn't a household name at Kennedy Space Center. In fact most space center employees have had little dealings with the company that will sign about 1,900 paychecks starting next year.

When stacked up against aerospace giants like Lockheed and Boeing, EG&G is the runt of the litter. In comparison, Boeing recorded about \$9 billion in sales last year while EG&G reported \$704 million in sales for 1981.

But when it came time Monday for NASA Administrator James Beggs to choose a company to operate and maintain Kennedy Space Center -- a three-year contract worth \$193 million -- he picked EG&G.

Based in Wellesley, Massachusetts, EG&G is a diversified high-technology firm that has been making precision instruments for more than 30 years. The company is no newcomer to dealing with the government -- to date having managed more than \$6 billion in government programs.

With 18,000 employees, Fortune Magazine ranked EG&G 428th in sales among the 500 largest companies.

Founded in 1947, EG&G has no single predominant product line. But it has had a reputation in the weapons' business.

In its defense contracts, EG&G has built electronic components for weapons systems and the company's Special Projects Division is now working on a new combat system for attack Submarines.

EG&G works closely with the government's national weapons laboratories and the company's Energy Measurements Group furnishes instruments for use in the underground nuclear bomb tests in Nevada.

In its early years, EG&G was almost exclusively a government contractor dedicated to weapons research, according to the company's 1981 annual report. "And though names have changed and missions broadened, the company's role in the nation's nuclear weapons programs continues to be important," the report reads.

Two areas where EG&G has diversified are in biological and energy research. The company manages the Idaho National Engineering Laboratory for the Department of Energy and is involved in synthetic fuels and hydro-electric power research.

EG&G Mason Research Institute at Worcester, Massachusetts, is a center for cancer and poisons studies. (TODAY, 11-30-82, p. 12A)

DECEMBER 1982

December 1: Space Shuttle Challenger, cutting through the pre-dawn fog like an apparition, made its way to the launch pad Tuesday.

The fully assembled Shuttle, 12,000 pounds lighter than its predecessor Columbia, completed a 3-mile ride from its hangar to launch pad 39A by 10:35 a.m.

By the Christmas holidays, engineers are scheduled to test fire Challenger's three main engines and the Shuttle's payload should be stowed inside the cargo bay by the first of the year, said Jim Ball, NASA spokesman.

A crew of four astronauts will spend three days in space during the sixth mission -- their primary duty to deploy into orbit the largest communication satellite ever.

Called TDRS, the satellite is part of a network designed to provide continuous radio and data relays between the ground and future Shuttles.

"By then (the test firing), we should firm up the launch date," Ball said. Liftoff is tentatively scheduled for January 24.

Challenger is a far lighter Shuttle than Columbia, now in its hangar for a nine-month tuneup and renovation.

Challenger's peach-colored fuel tank is 6,000 pounds lighter, the two booster rockets weigh 4,000 pounds less and the Challenger spacecraft itself is about 2,000 pounds lighter than Columbia, Ball said.

Putting the Shuttle on a weight-reduction program is part of NASA's overall plan to increase the spacecraft's carrying potential.

The Shuttle began its journey over a bed of crushed Alabama river rock at 4:19 a.m.

The 184-foot-high spaceship was propped on a steel-gray mobile launch platform.

This platform recently was refurbished from its last mission -- the 1973 launch of Skylab. (TODAY, 12-1-82, p. 1A)

December 2: PRC Systems Sevices Co. and the architectural and engineering firm Briel, Rhame, Poynter and Houser Inc. will design ground support equipment for Launch Pad 39-B at the Kennedy Space Center under a \$5.9 million NASA contract.

PRC and BRPH will pursue the project in a joint venture. The contract period began November 22 and continues to June 30, 1983.

Pad 39-B was last used in the Apollo space program. It is being modified for use by the Space Shuttle and the necessary work is expected to be completed in early 1986. Thus far, all Space Shuttle launches have been from Pad 39-A, for which both PRC and BRPH designed support equipment and modifications under earlier NASA contracts.

The new contract calls for such items as components to regulate and distribute gases and propellants to the launch pad, a fuel cell servicing system and electrical control panels for the liquid oxygen and hydrogen systems. (TODAY, 12-2-82, p. 16C)

<> When TODAY published the news Tuesday that the new contract to operate the Kennedy Space Center for the next three years will go to EG&G Inc., our switchboard received many calls from readers asking what the initials represent. That shows how little is known about the company that beat out such familiar Space Coast names as Boeing, Pan American and Lockheed.

But EG&G (Edgerton, Germeshausen & Grier) is no "Brand X" firm blindly drawn from a hat. It is a diversified, high-technology engineering and weapons company with an outstanding track record for efficient management and security operations of major federal facilities.

We believe the selection of this firm, personally approved by NASA Administrator James Beggs, signals a move by the space agency to tighten the management of its operations -- to get the job done better and for less cost. That's a sensible move, because unless NASA does a better job of cost cutting in routine operations, it is likely to have a much harder time getting funding in the future to undertake costly new ventures in space such as building a permanent space station.

There probably are few people living in Brevard who haven't heard stories from friends who work at KSC about the waste and inefficiency that frequently has occurred in some operations there.

It will be EG&G's task to trim costs in operating the space center's security, fire control, janitorial services, water, sewer and heavy equipment. Expectations are that more than 200 contractor employees will be trimmed from the workforce at KSC by the end of next year. Even though we don't like to see workers lose their jobs, we can't argue with a move to trim excess positions from a tax-supported payroll. It is not unreasonable to expect that a streamlined operation under tight management will be able to turn in equal or better performance.

EG&G, a Wellesley, Massachusetts-based firm, will receive \$193 million for its three-year contract. A couple of important factors that apparently influenced NASA to select this firm were its record of success in operating high-security military facilities and its demonstrated ability to reduce labor-management tensions. There will be a need for enhanced security at KSC in the future, as Space Shuttle operations move into new operational phases.

We congratulate EG&G for its successful bid and we applaud NASA's realization of the need to tighten the management of its major operations. (TODAY editorial, 12-2-82, p. 14A)

December 3:(Brevard County) commissioners decided to back NASA in its opposition to oil and gas exploration off Port Canaveral.

NASA has asked the federal government to drop its plans to sell oil and gas drilling leases on about 11 million acres of Atlantic Ocean floor within the Kennedy Space Center's flight clearance zone.

NASA officials fear that Shuttle components, such as the solid rocket boosters, would face possible damage if they struck an oil rig during a launch.

The rocket boosters are jettisoned into the ocean shortly after liftoff.

In an emergency the craft's external tank also would be dumped into that area. On a successful mission, the external tank stays on the Shuttle until it climbs 64 miles into the atmosphere, where the tank disintegrates.

County officials say another major reason they want to support NASA is because the ocean floor is vital to the county's scallop industry -- which also lies within the flight clearance zone.

If NASA succeeds in getting the area cut from the 33 million-acre lease sale, the scallop beds would be protected from any ill-effects of oil and gas drilling, officials said. (TODAY, 12-3-82, p. 2B)

December 5: A top official of United Space Boosters Inc. says he expects NASA to approve plans for a Shuttle-related plant on Merritt Island within three weeks, despite opposition from island homeowners.

NASA will have no comment until a decision is made, said Fletcher Reel with the federal agency in Washington, D.C.

An association of homeowner groups is opposing the plant because it fears the facility will house permanently potentially hazardous chemicals.

If approved, the plant would employ 850 workers and create 350 local jobs for skilled, semi-skilled and maintenance workers by 1985, said Frank J. Lavacot, USBI executive vice-president. The new location would allow USBI -- now housed in three buildings at Kennedy Space Center and Cape Canaveral Air Force Station -- to set up a consolidated, more efficient assembly-line layout, he said.

USBI is under a KSC contract to build the Space Shuttle's solid rocket boosters....

KSC's Smith said the same NASA safety regulations at the space center will apply at the off-site USBI facility.

Likewise, state Department of Environmental Regulation standards will be the same, said DER spokesman Cliff Miller.

Miller cited only one difference between regulations in the county's conditional use permit and DER's hazardous waste registration. The county's permit allows short-term storage of wastes for up to 30 days. USBI has registered with DER as a generator of hazardous wastes, which allows storage of hazardous wastes for up to 90 days.

County environmental planner Stephen Peffer said DER-enforced federal regulations would supercede the county's conditional use permit.

Regardless, Lavacot said USBI will not store any chemicals or wastes for more than 30 days and quantities will not exceed in any given month: 10, 55-gallon steel drums of perchlorethylene, two drums of methylene chloride and 4 gallons of citric acid.

USBI is awaiting final DER permits to dig out a basin next to the facility to accommodate transport barges and to sign a lease with Port Canaveral for an easement, Lavacot said.

A draft map of the entire site shows 200 acres bordered on the east by NASA property, unused land on the west, Madison Avenue on the north and a barge canal access to the south. The site is about eight-tenths of a mile from the nearest established residence in Ridge Manor. That house also is separated from the property by the Barge Canal. (TODAY, 12-5-82, p. 2B)

<> EG&G is pleased to announce that it will soon join the team at Kennedy Space Center as Base Operations Contractor.

During the ensuing weeks, we will begin to establish ourselves in the community. Our highest priority is to proceed to accept our new responsibility without disruption to the current shuttle program, to retain current employees to the maximum extent possible and to allay as rapidly as possible the natural uncertainty which accompanies any change as dramatic as the announcement of the BOC.

Within the next few days, additional information concerning employment opportunities, community and work force briefing sessions and a general schedule of events for the 30 day period, will be forthcoming.

Our desire is to become an effective and respected member of your community. Please accept our sincere apology for any inconvenience and uncertainty to which you may be subjected during this brief transition period.

EG&G Florida, Inc.
P.O. Box 1440
Cocoa Beach, Florida 32931

(TODAY, 12-5-82, p. 9A)

December 7: Wackenhut Services, Inc., of Coral Gables, Fla., has been awarded a \$1,383,711 extension of its contract with NASA to provide services at the Kennedy Space Center.

This new award brings the total contract value to \$51,734,632, and covers the period from December 1 to December 31, 1982. Under the terms of the contract, Wackenhut is to furnish security, law enforcement and fire protection and rescue personnel at KSC. Wackenhut is also to provide plant protection and fire prevention programs for employees at the center. (KSC RELEASE NO. 326-82, 12-7-82)

<> NASA's John F. Kennedy Space Center has awarded Boeing Services International, Inc., Kennedy Space Center, Fla., a \$2,581,363 extension to an existing contract. This contract extension is an exercise of an option for work functions which will eventually be transferred to KSC's base operations contract (BOC). The base operations contract will consolidate institutional and support services now provided by 14 different contractors at the Space Center. EG&G, Inc., of Wellesley, Massachusetts, was recently selected for negotiations that will lead to the award of this contract.

Under the terms of the new contract extension, BSI will provide certain institutional support services, which includes utilities, facilities and some technical operations, for a one-month period.

This new cost-plus-fixed-fee extension covers the period from December 1 through December 31, 1982, and brings the total value of the contract to \$314,189,908, since its inception in July, 1977. (KSC RELEASE NO. 324-82, 12-7-82)

December 8: A recently completed commercial building in Cocoa has become the local headquarters for EG&G Inc., the firm that has the \$193 million task of operating the Kennedy Space Center.

Reed H. Duncan, owner of the building at 950 N. Cocoa Boulevard, said Tuesday that EG&G is quickly setting up shop in the 3,800-square-foot facility.

Duncan and EG&G representatives were negotiating a rental agreement last week and came to terms Friday night. Monday the furniture began arriving. "It was unreal," Duncan said. "Yesterday (Monday) they moved all their equipment in. They had their phone in and their electrical people in."

"These people are in a hurry. They moved 40 desks in yesterday, all their copying machines and their typewriters," Duncan said. EG&G's Space Center operations actually begin early next year, but there is plenty of preparation to do now.

Based in Wellesley, Massachusetts, EG&G has promised NASA it will cut the center's operating costs in the areas of fire control, security, janitorial services, utilities and heavy equipment. The company beat such giants as Boeing and Lockheed to win the initial three-year contract. (TODAY, 12-8-82, p. 14C)

December 9: More than 200 local homeowners -- concerned about a space firm's proposed Merritt Island plant -- finally met Wednesday with United Space Boosters Inc. officials.

It was evident from questions at Wednesday's meeting that fear-fetching rumors about the plant for non-launch activities still ran rampant. But the orderly crowd responded with laughter when one near-hysterical woman compared the future situation with New York's "Love Canal" disaster.

Space-related industry is not a sin in the eyes of many islanders who are employed by Kennedy Space Center, but they aren't sure this off-site location is safe. Most of the questions from the floor were from those KSC workers well-versed in the language. Talk was technical.

Homeowners oppose the plant primarily because its operation will involve hazardous waste storage.

The chemicals that will be on-site -- primarily methylene chloride and perchlorethylene -- are solvents used by USBI to remove any fuel or cleaning residue from forward thrust and parachute control sections of the boosters, according to USBI spokesman Rick Smith.

The chemicals are or aren't suspected carcinogens -- depending on who's doing the talking.

DER spokesman Cliff Miller, who is responsible for inspection of all hazardous waste storage at KSC, said standards will be the same and he would inspect the Merritt Island site at least once a year.

USBI executive vice president Frank L. Lavacot said USBI will not store any chemicals or wastes for more than 30 days and quantities will not exceed in any given month: 10 (55 gallon steel) drums of perchlorethylene, two drums methylene chloride, and four gallons of citric acid.

USBI said last week NASA approval of a north Merritt Island facility for non-launch operations should be forthcoming before the year's end.

If approved, the plant would employ 850 and create 350 local jobs for skilled, semi-skilled and maintenance workers by 1985, said Lavacot. It will allow USBI, now housed in three different facilities at Kennedy Space Center and the Air Force Station, to set up a consolidated, more efficient assembly-line layout, he said.

Building a suitable single facility and having easy access to all operations will be cost-effective, Lavacot said. He estimated a savings of \$400,000 per Shuttle flight.

Lavacot said USBI will develop only 39 of the 130 acres it has an option on. Construction of the proposed plant and related facilities will take about two years, according to Bernard A. Cocchi, USBI vice president of operations. If USBI went through NASA for a KSC site, it would take an additional two years, he said.

USBI is awaiting final DER permits to dig a basin next to the facility to accommodate transport barges and signing a lease with Port Canaveral for an easement, Lavacot said.

Residents are also concerned with another dead-end canal, which they say will hurt water quality. Application for DER's dredge and fill permits has been made, Lavacot said. But permits won't be available until completed buildings are approved. (TODAY, 12-9-82, p. 2B)

December 10: Rockwell International Corporation has formed a new Shuttle Launch Operations Division that will pursue the NASA contract for the launch and turnaround operations of the Space Shuttle, the company announced Thursday.

A new division, to have its headquarters in Cocoa Beach, intends to conduct its activities both at Kennedy Space Center and at Vandenberg Air Force Base in California. Richard Schwartz will be the vice president and general manager of the division and will report directly to the president of Rockwell's Space Transportation and Systems Group.

Rockwell intends to seek the upcoming NASA contract for the preparation, launch, landing and servicing of the reusable orbiter. That contract, worth a potential \$2.7 billion to the private company selected, is a necessity to achieve cost savings, now that the Shuttle program is in its operational phase.

The spacecraft itself is manufactured by Rockwell International at its Palmdale, California, plant. Rockwell spokesman Robert Gordon said the company is confident that

the experience and the efficiency it achieved in past Shuttle activities will give it a competitive advantage in the race for the NASA contract.

Rockwell is not without competition. Last month, Lockheed Corporation announced the formation of the Lockheed Space Operations Company, a new division based in Titusville. Lockheed has a working agreement with Grumman Aerospace, Pan American Airlines and Thiokol Corporation to unite their efforts in seeking the processing contract.

A similar team effort combines Rockwell with Boeing Services International, Martin Marietta, United Space Boosters Inc. and United Airlines. That lineup was unveiled in November and, with the exception of United Airlines, all have current NASA contracts for launch work and processing at KSC.

NASA is expected to issue a request for proposals in January, a formal soliciting of plans from the various competitors outlining how they intend to provide the needed services. The actual awarding of the contract is scheduled for late 1983.

The Rockwell Shuttle Launch Operations Division initially will be comprised of three basic elements -- Rockwell's KSC Launch Operations that does Shuttle processing work now, Rockwell's Vandenberg AFB field operations and the Shuttle contract proposal team effort.

Establishment of the new division was announced by Rockwell Space Operations President George Jeffs. (TODAY, 12-10-82, p. 16C)

<> NASA's John F. Kennedy Space Center has awarded Atlantic Technical Services of Longwood, Florida, a small business firm, a \$110,406 contract extension to provide mail and distribution services at KSC. This award brings the cumulative value of Atlantic's contract with NASA to a total of \$2,751,813.

The contract covers the period from May 1, 1980 through December 31, 1982. (KSC NEWS RELEASE NO. 329-82, 12-10-82)

<> A proposed reorganization of the Kennedy Space Center designed, "...to carry the center into the operations era," has been announced by Center Director Dick Smith.

Key management officials were detailed to their new jobs effective December 1.

The most significant change, Smith said, in a letter to Center employees, is combining project management and operations in one organization, in the case of both shuttle vehicle and cargo. "This change...anticipates and prepares for multiple flow, contract self-sufficiency, and a changed civil servant management approach."

Four major directorates emerge from the new organization, Shuttle Management and Operation under Thomas E. Utsman; Center Support Operations, under Robert G. Long; Cargo Management and Operations headed by Thomas S. Walton; and Engineering Development under Peter A. Minderman. Portions of the former Technical Support Directorate were transferred to the Shuttle and cargo organizations.

Smith said that although the restructure has not been formally approved by Headquarters, that key officials have been briefed and agree with the approach he is recommending. He said he was detailing the KSC managers to the new positions at this time in order to minimize the time required to implement the new structure.

"I also am establishing a new position on my staff titled Associate Deputy Director," Smith said. "The primary function of the position will be to assist George Page and me in the smooth and efficient transition to the Shuttle operational era." Andrew J. Pickett will fill the new position.

Smith emphasized that there is sufficient work for the KSC work force for the foreseeable future and, consequently, there are no planned large reductions in the KSC civil service population.

"I believe we will be taxed to the limit to accomplish the tasks assigned to us," he said. "We must all continue to seek ways to do our jobs better, become more productive, and institute cost and manpower savings wherever practical."
(SPACEPORT NEWS, 12-10-82, p. 1, Vol. 21, No. 25)

<> The awesome thrill of fiery launch on November 11 passed and the STS-5 mission proceeded on schedule with the successful deployment of the shuttle's first two operational payloads -- communications satellites for Satellite Business Systems and Telesat Canada.

Columbia, reflecting the gold of a rising sun, swept down from the heavens and made a pinpoint landing on a paved runway at NASA's Dryden Flight Research Facility on Edwards Air Force Base in California's Mojave Desert at 6:33 a.m. PST on November 16.

Waiting for Columbia's landing -- described as "as light as that of a butterfly with sore feet" -- was a KSC recovery convoy deployed into position near the runway at 4:25 a.m. PST. The convoy consisted of the specialized vehicles and about 100 personnel needed to safe and service the spacecraft, exchange flight for ground crews, and tow Columbia to the Mate/Demate Device at DFRF to be prepared for the ferry back to KSC.

Also waiting for Columbia's landing was a turnaround crew of about 200 NASA and contractor personnel flown into Dryden from KSC aboard a chartered DC-10 the previous afternoon.

The seven-mile tow from the end of the runway back to Area A at DFRF began 1 hour, 35 minutes, after touchdown and was completed within 3 hours, 48 minutes, despite concern over a pressure decay in the left inboard main tire which had locked for a brief interval during Columbia's 9,553-foot landing rollout.

"Every major milestone in the convoy operation established a new record," observed Bill Williams, Convoy Commander. The crew hatch was opened within 24 minutes of landing, ground cooling was activated within 26 minutes, the flight crew left within 34 minutes, and the tow began 25 minutes ahead of schedule.

Landing was on a Tuesday morning and the light turnaround timeline called for the 747 Shuttle Carrier Aircraft to begin the two-day ferry flight back to KSC the following morning.

Would that schedule be met?

Asked that question during a news conference at DFRF the day after landing, KSC Ground Operations Manager Jim Harrington predicted that it would. He reminded the press that a similar schedule had been faced during the turnaround at STS-4 in July and had been successfully accomplished.

"We're just getting better at it," Harrington observed.

Work continued around the clock through the week and, despite high winds and cold night temperatures, the timeline was met. Right on schedule, the SCA, with Columbia riding piggyback on top, taxied onto the Edwards AFB runway and took off with KSC as its destination at 7:33 a.m. PST on Sunday, November 21.

After an overnight stop in San Antonio, Texas, the SCA took off again and landed at KSC to complete the final leg of the trip at 12:14 p.m. EST on Monday, November 22.

Summarizing the success of the operation, Harrington noted: "Undoubtedly, it was the best turnaround we've ever had. Everyone did a great job. This was the fifth time the team had done this and we had no major problems to interfere with our schedule. Everyone knew their job and went out and did it."

The Dryden to KSC turnaround -- like shuttle missions -- have become routine operations. (SPACEPORT NEWS, 12-10-82, pp. 4 & 5, Vol. 21, No. 25)

December 13: Space Commerce Act:

Congressman Akaka (D-HI) introduced H.R. 7411, to streamline the current procedure by which a private company is granted permission to launch a vehicle into space; the measure was referred to the House Science and Technology Committee.... (OFFICE OF LEGISLATIVE AFFAIRS, LEGISLATIVE ACTIVITIES REPORT, 12-13-82, Number 150)

December 14: Federal prosecutors said Monday two companies and their presidents failed to tell NASA officials who was really performing the work in two Shuttle-related contracts.

During closing arguments of a 4-week-old fraud trial, prosecutor Ann Arbor told the 12 jurors and four alternates that the Chicago-based Mayfair Construction Co. -- through its Kennedy Space Center contractor Capital Communication Corp. -- was supposed to be the prime contractor on the two projects.

However, New World Construction Co. of Titusville actually supplied all the labor and equipment, she contended. Capital president Phillip Akwa of Milwaukee served a sort of a middleman, Arbor claimed, reaping a profit on the work New World performed.

The trial in U.S. District Court in Orlando stems from a 20-count indictment issued in January against Capital, New World and three men.

Capital, Akwa, New World and its president, Arthur Boschen, all are accused of five counts of making false statements to the federal government.

In addition, Akwa, Boschen and New World engineer Thomas White, Jr. of Melbourne are accused of conspiring as early as 1976 to defraud the U.S. government, Arbor said. The three also are charged with two more counts of making false statements.

Akwa and Capital Communications are being tried on another count of making a false statement and submitting a false claim. However, 10 additional charges against Akwa and Capital will be considered in another trial.

Each count carries a maximum penalty of five years in prison or \$10,000 fines or both. The men have been free on bond.

According to the contract, Mayfair should have performed at least 20 percent of the work on a structural steel project inside the Orbiter Processing Facility and 30 percent of the work on a project to renovate the mobile launch pad for Space Shuttle use, said U.S. prosecutor Ed Tomko.

But Boschen and Akwa went to elaborate lengths to keep NASA unaware that New World was actually supplying all the equipment and labor, Arbor said.

Although the workers received their paychecks from Mayfair, New World Construction was to reimburse Mayfair for the payroll expenses, she said. The full extent of New World's contract with Mayfair also was hidden from NASA, prosecutors said.

Akwa and Capital were entitled to up to 40 percent of the profits on the NASA contracts by Mayfair, Tomko said, but would also bear up to 40 percent of the losses.

By the end of 1977, work on the Orbiter Processing Facility and Mobile Launch Pad was almost finished, Tomko said. The pad project in particular experienced tremendous cost overruns, he said.

But there was no way for Akwa and Capital to recoup their losses through change orders -- amended costs for unanticipated work on a contract -- because they had no equipment or labor expenses.

Instead, Akwa allegedly inflated New World's cost proposals to add a margin of profit, Tomko said. (TODAY, 12-14-82, p. 1B)

<> NASA officials are investigating how a rocket nose cone, being carried on a tractor-trailer, snapped two high-voltage power lines Friday at Kennedy Space Center.

A space agency board formed Saturday will determine if the 20-foot-high, fiberglass nose cone was damaged when it hit the wires and if the February 10 launch of an international communications satellite, INTELSAT 5, will be delayed, said Hugh Harris, NASA spokesman.

The million dollar cone, called a nose faring, is designed to fit over and protect the \$30 million satellite during launch.

The nose faring was being moved five miles from Launch Pad 36, where it underwent tests, to a satellite assembly building where it was to be attached to the INTELSAT 5.

No injuries were reported in the 5:30 p.m. accident, and the wires were cleared so the nose faring could complete the trip. Repair of the two 13,000-volt lines that supply power to the pad was proceeding smoothly, Harris said.

The investigation board, headed by Billy Childers, chief of NASA's technical division support at KSC, was formed Saturday to determine the cause of the mishap and the extent of the damage.

INTELSAT 5, owned by a consortium that includes the United States and 105 other countries, will provide both land and maritime telephone communications. (TODAY, 12-14-82, p. 16A)

December 16: The Committee to Save Sykes Creek claims Merritt Island again is facing a threat to its water quality -- this time from a proposal to dig a basin for boats to turn around in the Barge Canal.

United Space Boosters Inc. is seeking state permission to dredge the turning basin so that boats can carry Space Shuttle booster parts to a site just north of the Barge Canal for refurbishing.

But committee Chairman Bob Sampson said the basin might harm water quality in the Barge Canal and, to a lesser degree, nearby Sykes Creek.

The basin's impact on water quality would be similar to that of the man-made canals currently creating a problem for Sykes Creek, Sampson said.

Sunlight wouldn't reach the bottom of the proposed 14-foot-deep turning area, cutting the level of dissolved oxygen in the water, Sampson said. Dissolved oxygen is what fish and other aquatic animals need to breathe.

Because of the committee's concerns, officials from USBI and the state Department of Environmental Regulation will meet with committee members Friday.

USBI needs a DER permit to dredge the canal to build the turning basin, said Lee Miller, assistant DER district manager for the area that includes Brevard.

DER has announced it plans to grant USBI a dredge-and-fill permit for the job, which DER officials consider environmentally safe, Miller added.

If committee members aren't satisfied Friday that the dredging would be safe, they may request a formal hearing on DER's decision to issue the permit.

Sampson said the committee will ask that the turning basin not be constructed and that trucks rather than boats carry the booster parts to and from the proposed site of the refurbishing plant.

But USBI officials say they would need to build a new road to return the booster parts to Kennedy Space Center once they are reassembled because SR 3 -- the road that connects the site to KSC -- can't be used.

When reassembled, the three parts that would be refurbished at the site of south of KSC stand 26 feet tall -- too tall to clear the overpass at the NASA Causeway and SR 3, Rick Smith, USBI spokesman. The reassembled parts can't be placed on their side on a truck bed because of their sensitive electrical equipment, Smith added.

The barge would travel to KSC from the site by traveling east on the Barge Canal and then north on the Banana River. This would be far less costly than constructing a road to KSC, he added.

The three parts to be refurbished at the proposed site just north of the Barge Canal are the frustrum and forward and rear skirts, Smith said.

The portions of the booster rockets that contain fuel would be left at KSC after the rockets are retrieved from the ocean and disassembled at the space center, he said.

If USBI officials insist the turning basin is needed, Sampson said, the committee will suggest its size and depth be reduced from what USBI proposes in its dredge-and-fill ocean.

Rather than needing a turn basin for a large ship, USBI plans now require a basin only large enough for the barge that will carry partially assembled boosters, Smith said.

In contrast to committee members, DER officials are confident the dredging won't harm either the Barge Canal or Sykes Creek, which is connected to the canal just north of SR 528.

"It looks like they're taking every precaution to protect the Barge Canal and Sykes Creek," Miller added.

USBI plans to protect against chemicals used at the plant reaching the creek by cleaning up any spills with a vacuum-like machine, Miller said. As a result, he said there's a remote chance any chemicals will be spilled in the canal.

And the ships that carry the boosters will use special equipment to protect against oil and gas spilling into the canal, Miller said.

Smith said other environmental measures by USBI include:

- * USBI won't put the dredging material onto any wetlands, that provide a natural filtering process for nutrients in water runoff.

- * USBI is considering using an air bubble system to raise the Barge Canal's oxygen level, which Smith contends is already below state standards.

- * The barges that carry the boosters won't use any paints containing copper, which also is a problem in the canal. (TODAY, 12-16-82, p. 2B)

<> Attorneys wrapped up closing arguments and jurors deliberated for a few hours Wednesday on whether two NASA subcontractors and three of their employees inflated labor and equipment costs.

The 12 jurors are to resume considering the 10 charges, four weeks of testimony and more than 200 exhibits at 8:30 a.m. today.

On trial are Capital Communications Corp. and its president, Philip Akwa of Milwaukee; New World Construction Co. and its president, Arthur Boschen of Titusville; and James White, Jr. of Melbourne, a former New World engineer.

The men also have been accused of conspiring to charge NASA for excessive labor and equipment costs and planning to withhold information from NASA concerning agreements between the companies.

Defense attorneys contend government officials do not know how much the work should have cost in the first place.
(TODAY, 12-16-82, p. 2B)

December 18: It was 20 seconds of Christmas cheer for NASA engineers Saturday morning as they throttled the Shuttle Challenger's three main engines. The test firing was "a resounding success," said Al O'Hara, director of Shuttle launch operations.

It was the last big test in the preparation of the Challenger for its mission in late January. The new engines on the new Orbiter never had been test fired together.

Final results of the punctual 11 a.m. test should be ready by noon Wednesday after technicians crawl through the 7-foot-wide engine cavities and assess any damage. By then NASA officials in Washington will set a date for liftoff.

At this stage, NASA expects a launch no earlier than January 27.

O'Hara said results were so encouraging that Challenger's five-day mission could be extended a few days.

For NASA brass including General James Abrahamson, a NASA associate administrator watching in the Shuttle firing room, the test was handled no differently than a launch.

Although there were no astronauts in the cockpit, there was plenty of engine roar and mashed potato-like smoke that flooded launch pad 39A.

A now-routine launch countdown began some 56 hours earlier and by late Friday night the service structure that covers the Challenger was moved back.

Early Saturday morning the 15-story fuel tank was filled with 1.5 million gallons of liquid propellant, but only about 60,000 gallons were used in the test firing.

During launch the Challenger's engines will operate eight minutes.

At first glance the Challenger's three engines are no different from the Columbia's. But they do provide 4 percent more thrust -- about 390,000 pounds per engine.

Aside from putting the engines through their paces, the Flight Readiness Firing also tested the new lightweight fuel tank. Weighing about 67,000 pounds, it's 10,000 pounds lighter than its predecessor.

On January 10, engineers will conduct a simulated countdown and launch with astronauts Paul Weitz, Karol Bobko, Donald Peterson and Story Musgrave. (TODAY, 12-19-82, p. 1A)

December 20: Allegations that Rockwell International Corp. diverted funds from the civilian Space Shuttle program to develop the B-1 bomber have sparked an investigation by Congress and the Pentagon, according to a published report.

The investigation is aimed at learning whether the alleged practice contributed to nearly \$5 billion in cost overruns on the Space Shuttle and unrealistically low cost estimates for the B-1, according to sources quoted in Sunday's editions of the Chicago Tribune.

But Lt. Col. William T. Cooper, the Pentagon's public affairs officer for the B-1, said in a telephone interview Sunday he was not aware of any investigation into Rockwell or the allegations.

According to the Tribune, the reason for the inquiry comes from hundreds of timecards showing that after President Carter ordered the B-1 program halted in 1977, Rockwell executives simply kept engineers working on the bomber while billing their salaries to the Shuttle.

Former Rockwell employee Ray Sena supplied the records, the newspaper said. Sena was fired in 1979 after he provided timecards, travel vouchers and evidence to the FBI showing irregularities in other programs, including billing costs of military satellites to the Shuttle, it said.

The names of several mid-level management Rockwell supervisors are listed in a Pentagon investigative report which says they gave depositions acknowledging participation in charging the Shuttle account for work done on the Havstar Global Positioning System, a navigational satellite. (TODAY, 12-20-82, p. 12A)

December 21: Failed efforts to woo Merritt Island residents has United Space Boosters Inc. -- makers of the Space Shuttle's solid rocket boosters -- looking at an undisclosed alternative Brevard County site, USBI vice president Frank J. Lavacot said Monday.

USBI's year-long pursuit of a 130-acre north Merritt Island plant site has been met with community outcries, which culminated last week when protesters donned gas masks and shouldered anti-cancer placards. Homeowners' foremost complaint is the proposed on-site storage of chemical and hazardous wastes.

While USBI hasn't ruled out the undeveloped Merritt Island parcel adjacent to Kennedy Space Center, the firm is negotiating an option on another county location, Lavacot said. He would not identify the location except to say it is one the company considered about a year ago. Negotiations have been continuing for about two weeks, he said.

The only other Brevard County site publicized by USBI officials is in the Titusville-Cocoa Airport Authority's part of Gateway Center Industrial Park.

Ti-Co officials say they have not been contacted. (TODAY, 12-21-82, p. 1B)

<> Four days after they began deliberating, a federal jury returned guilty verdicts Monday against two NASA contractors and three men charged with inflating labor and equipment costs in a complicated scheme of fraud and deceit.

The jurors, who began their deliberations at noon Wednesday and broke for the weekend, had a 10-count indictment, four weeks of testimony and 200 exhibits to consider. At 11:38 a.m. Monday, after 20 hours and 17 minutes of deliberations, they returned to the federal courtroom in Orlando with 36 guilty verdicts and one of innocence.

The verdicts:

- * New World Construction of Titusville and its president, Arthur Boschen, each guilty on seven counts of making false statements to the U.S. government.

- * Former New World employee James T. White, Jr., of Melbourne, guilty on two counts of making false statements and innocent of conspiracy. A third charge of making false statements was dropped.

- * Capital Communications Corp. of Milwaukee and its president, Phillip Akwa, each guilty on eight counts of making false statements and one count of making a false claim.

- * Akwa and Boschen each guilty of conspiring to defraud the government.

Each count carries a maximum penalty of five years in prison, a \$10,000 fine or both.

Boschen's attorney said the case would be appealed. Attorneys for Akwa and White said a decision to appeal in the 11th Circuit Court of Appeals in Atlanta has not been made, but that one is likely.

Frank Gimbel, the Milwaukee attorney representing Akwa and Capital, said he intends to ask the judge to dismiss the jury's decision or at least grant a new trial because of some procedural problems in the trial.

"It was a very complicated case," Gimbel said. "I question whether the jurors understood it. It's very difficult to beat the United States of America."

Assistant U.S. Attorney Edwin Tomko of Washington, D.C., who prosecuted for the government, said he expects District Judge John Reed, Jr., to hand down sentences within 45 days.

The men and their companies were indicted in January at the end of a three-year investigation into their activities from 1975 to 1979.

Ten more charges against Akwa and Capital are still pending. A trial has not be scheduled yet. (TODAY, 12-21-82, p. 1B)

December 24: The first American woman to fly in space said she would like to consult her Soviet counterparts before making the trip in April. But Shuttle astronaut Sally Ride said, "the lines of communication are not open."

Speaking near launch pad 39A Thursday, Ride said she has had no contact with either Valentina Tereshkova /or/ Svetlana Savitskaya, the world's first two women astronauts.

When asked what she would ask the Russians, Ride, 31, said she "wasn't sure" but added her curiosity is picqued. "We don't know what they did on their flights."

Soviet aerospace secrecy and less-than-perfect relations between the two countries have limited the exchange of ideas between astronauts and cosmonauts.

"We've seen what you've seen," said Bob Crippen, pilot of shuttle Columbia's maiden voyage who will return to space as commander of the April mission.

Ken Pedarson, NASA's director of international affairs, said while Ride hasn't made any specific request to speak with the Soviet women cosmonauts, he said it could be arranged from our end, providing it's not "a publicity stunt." He also cautioned, "We don't know what the Soviet response would be."

Said Pedarson, "The U.S. clearly is not going to go out of its way. Given the political situation, we are not encouraging our astronauts to call the cosmonauts. We would have to ask, what is the objective of such a conversation."

Crippen said he doesn't view competition between the two countries "as a race anymore."

But he cautioned against "sitting back on our laurels. The Soviets have an active program, they've held records," he said referring to the record 211 days in space spent on Salyut 7.

Crippen and Ride were joined by crew members Frederick Hauck and John Fabian at Kennedy Space Center for simulated, computerized liftoff and landing of the Shuttle Challenger.

The April mission, the seventh Shuttle flight and the second for the Challenger, will be the first co-ed American space flight but Ride said she's confident the Shuttle can accommodate the mixed crew.

"There's plenty of room," Ride said. "...The Shuttle was designed to carry men and women and I see no problem with that."

Quipped Crippen, "She gets her own sleeping bag."

A fifth crew member, Dr. Norman Thagard, was named Tuesday to conduct medical tests to collect information on space sickness.

"He (Thagard) won't treat us, but he will investigate the mechanisms in the body that cause space sickness," said Crippen, who emphasized the doctor won't be drawing any blood.

During the April mission, the astronauts will deploy two communication satellites into space and they plan to make the first landing at the space center's 3-mile-long runway.

Crippen said although a spacewalk isn't planned for the mission, Thagard and Fabian would make the venture into the Challenger's cargo bay if the planned spacewalk on this upcoming mission was cancelled. (TODAY, 12-24-82, p. 1A)

<> So far the transition to a single contractor to operate Kennedy Space Center has posed no surprises for either the engineers on the job, their bosses or the powerful unions known for calling strikes in the past.

Although space center employees expect as many as 200 layoffs in 1983, sources say most of those layoffs will be in mid-and-upper-level management positions as EG&G Inc. streamlines the KSC bureaucracy.

Jim Dubay, EG&G general manager at KSC, predicted no layoffs until after the first quarter of 1983.

"It's too early to tell when there would be layoffs. The first quarter is premature. It takes a while to get a lay of the land."

EG&G, a Wellesley, Massachusetts, engineering and weapons firm, will assume the responsibilities of 14 contractors starting January 1. The company in November submitted a successful bid of \$193 million to operate the space center, beating out larger incumbent contractors, Boeing Services and Wackenhut Services.

Although as many as 7,000 people have applied for space center jobs -- including security, fire control, heavy equipment and janitorial positions -- priority will be granted to those already doing the work under the incumbent contractors, Dubay said.

And there have been as many as 4,000 applicants from outside the space center, said Jack Story, EG&G director of advanced projects. "About 80 percent are from this area. They already have jobs but they're looking for something better and there are some from as far away as Connecticut and Texas."

Throughout the week, job hunters crowded into the suite of EG&G offices on U.S. 1 in Cocoa. Traffic was so heavy at times that police were needed to manage the flow. Although many won't be hired, the firm will compile a computerized list of potential recruits.

"As of Thursday night, EG&G hired 1,300. Altogether we should have 1,800." Story said.

The powerful International Association of Machinists represents about 500 people involved in the change of contractors and local union chief Roger Kendrick said he has no complaints.

"The union and EG&G have excellent relations. Their desire and ours is for a smooth transition," Kendrick said.

The machinists union struck Boeing in 1971, 1978 and 1981, and sources close to KSC say many in the union believe those strikes were divisive and they welcomed the new contractor.

Kendrick predicted most of the layoffs under the new contractor will be in management as EG&G "tries to do away with a lot of the redundant paper work."

He also said those laid off would be the first considered for employment if EG&G needs personnel. Collective bargaining between the union and EG&G is expected in January, said Kendrick.

One area that first may feel the impact of the new space center contractor is security, previously contracted to Wackenhut, which teamed with three other firms to compete for the overall operations contract.

Most of the present security guards will be hired by EG&G but the operation will get tighter, said Story.

Space center sources said NASA Administrator James Beggs and Shuttle program Director General James Abrahamson chose EG&G because of the firm's expertise in operating military facilities like the Nevada nuclear test site and the Naval Weapons Center at China Lake, California. (TODAY, 12-24-82, p. 1B)

December 28: The tracking satellite destined for a trip into Earth orbit from the Space Shuttle Challenger was moved to launch pad 39A Monday.

The 5,000-pound NASA satellite was hoisted to a specially designed changeout room at the top of the pad near the Shuttle.

By January 8, the satellite will be loaded into the 60-foot-long cargo bay, said Mark Hess, NASA spokesman.

Work at the pad this week will include a check of the satellite's electrical and computer systems, Hess said. The satellite, called a TDRS, for tracking and data relay system, is attached to a rocket that will propel it to a height of 22,000 miles -- far beyond the Shuttle's reach -- after it leaves the Challenger.

Launch of the Challenger still is set for no earlier than January 27. NASA officials said they will announce a firm date early next month. (TODAY, 12-28-82, p. 12A)

December 29: With EG&G Inc's takeover of operation and maintenance at Kennedy Space Center, some KSC employees are waiting to see if they'll be toasting in the New Year with champagne or with beer.

The Massachusetts firm has promised to "make every effort" to hire incumbent space center workers. But it was awarded its three-year \$193 million contract by promising to cut costs -- and jobs.

As many as 200 employees of 14 contractor companies at KSC could be out of work by 1983. But officials at some contract companies replaced by EG&G believe EG&G may need more workers than it had originally planned.

"We think they'll be hiring more people as they find out what the problems actually are," said an executive at one contractor company, who asked not to be identified. "At least we're hoping that."

Meanwhile, some companies will be meeting this week with EG&G in Arlington, Virginia, to negotiate subcontracts with the engineering and weapons firm.

"The only contact we've had is a letter of intent (from EG&G) for them to subcontract with us," said Al Nelson, project manager at Atlantic Technical Services Inc., which handles mail. "We'll be going to Arlington (this) week to meet with them to negotiate."

Nelson said Atlantic Technical will begin negotiating for 38 employees -- the number it has working at KSC. "They'll put their figure on the table and we'll probably come up with something in between," Nelson said.

"Right now, most companies are in a state of waiting. You have to sit down with (EG&G) eyeball to eyeball," he added.

Other companies said last week they hadn't been contacted by EG&G and will probably not be asked to subcontract.

"We haven't heard from them. There are no plans for us, apparently," said Robert Thompson of Planning Research Corp., which has done some design engineering for the space shuttle program. Thompson said his company has about 875 employees at the space center, and predicted that many will be hired by EG&G.

Still other companies' duties will be handled "in-house" by EG&G, automatically putting them out of the running or a major subcontracts.

"We offered our services, but they decided to do it themselves," said Frank Kelly, medical director for Pan Am's medical services and environmental health at the center. "We may work some small contracts, but they've already hired a medical director."

Kelly said he felt "a good many" of Pan Am's 120 employees at the center will be picked up by EG&G. "But I'm sure it won't be 100 percent," he added.

"They're not talking to us, and we're not talking to them," said Godfrey Bottomly of Boeing Services International, which handles ground services and transportation services at the center.

Insiders say that the smaller contractors at the space center stand the best chance of subcontracting with EG&G. Also, EG&G has pledged to use small and minority dominated companies for subcontracting.

Under its contract with EG&G, NASA expects to trim \$20 million annually of the \$100 million per year it now takes to operate and maintain the space center.

EG&G officials aren't saying much about the whole process, but they insist they'll be ready to take over operations January 3. The company will provide 1,800 jobs at the space center, and officials say about 1,700 have been hired so far.

Peter Chapsky, a spokesman for EG&G at the company's headquarters in Massachusetts, said company officials are in Brevard making an "intensive study" with NASA on hiring necessities at the space center.

He confirmed that EG&G has a commitment to hire employees already at the space center. (THE TRIBUNE, 12-29-82, pp. 1A & 3A)

- <> Jack Swigert, the former astronaut who died of complications from cancer, was hailed Tuesday as a "genuine, home-grown hero" who survived an explosion in space and narrowly missed his goal of serving in Congress.

Swigert died in Washington Monday night at the age of 51, a week before he would have taken the congressional seat he won in the November 2 election. (TODAY, 12-29-82, p. 1A)

- <> The plot continues to thicken in the proposed move of United Space Boosters Inc. to northern Merritt Island.

State environmental officials say USBI's proposed facility will require an air emission permit to operate, although corporate executives originally said they needed no permits to vent various chemical substances into the air.

Among the chemicals that would be vented are perchlorethylene, methylene chloride and 1,1,1-trichloroethane.

Chuck Collins of the Florida Department of Environmental Regulation's Orlando regional office says any new facility

such as the one USBI plans for Merritt Island "definitely" needs an air emissions permit from DER.

Failure to obtain the permit carries a fine of \$10,000 each day the violation persists, Collins says.

Collins notes that the present USBI operation at Kennedy Space Center is among the last of the space center's sources of air emissions not to have applied for a permit.

But Collins also says determining maximum allowable levels of emissions for USBI will be largely "a judgment call," since specific standards have not been established for the substances that would be released into the air.

"When we get the permit application we'll take a look at it," Collins said.

USBI recently stated it did not know what concentration of methylene chloride it was presently releasing into the air. A study conducted three years ago showed a perchlorethylene concentration of about 10 parts per million.

According to Collins, drycleaners in the Orlando area are presently permitted to release perchlorethylene in concentrations up to 100 parts per million.

A draft report issued by the Office of Toxics Integration of the federal Environmental Protection Agency indicates that at least two of the three major substances used by USBI -- perchlorethylene and 1,1,1-trichloroethane -- have been found to be cancer-causing. Evidence is still being evaluated on the carcinogenicity of methylene chloride.

Company executives earlier denied that the chemicals were suspected carcinogens.

One chemical, 1,1,1-trichloroethane, is also suspected of causing depletion of the ozone layer high in the earth's atmosphere. Ozone depletion is believed to cause an increased rate of skin cancer due to the atmosphere's reduced ability to block harmful radiation coming from space. (THE TRIBUNE, 12-29-82, pp. 1A & 3A)

December 31: Jim Dubay has been named president and general manager of EG&G Florida Inc., the company that will begin operating the Kennedy Space Center at midnight on Saturday.

EG&G Florida is the newly formed division of EG&G Inc., the Wellesley, Massachusetts, high-technology firm selected by NASA to run the Space Center -- a job previously performed by 14 separate contractors.

Dubay is the former general manager of EG&G Idaho National Energy Laboratories. His staff at the headquarters in Cocoa will consist of four general managers: Bob Parnell, programs and budget; John Pruden, operations and maintenance; Harold Gray, engineering; and Jackie Cooper, administrative services.

Four other key directors are: Tom Sanford, security services; Bill Yurowsky, reliability and quality service; Jim Walton, industrial relations; and Dr. James Culver, medical director.

Culver and Gray are former Space Center staff members. The other executives were transferred to Florida from EG&G operations in Idaho, Nevada and New York. (TODAY, 12-31-82, p. 12C)

Appendix A

1982 NASA LAUNCH RECORD

<u>Date</u>	<u>Payload</u>	<u>Launch Vehicle</u>	<u>Launch Site</u>	<u>Mission Remarks</u>
January 15	RCA-C	Delta	ESMC*	RCA communications.
February 25	Westar-IV	Delta	ESMC	Western Union communications.
March 4	Intelsat V-D	Atlas Centaur	ESMC	Intelsat communications.
March 22	OSS-1	STS-3	KSC**	Office of Space Science.
April 10	Insat 1-A	Delta	ESMC	India communications.
June 8	Westar-V	Delta	ESMC	Western Union communications.
June 27	DOD 82-1	STS-4	KSC	Department of Defense.
July 16	Landsat-D	Delta	WSMC***	NASA earth resources applications.
August 26	Telesat-G(Anik-D1)	Delta	ESMC	Canada communications.
September 28	Intelsat V-E	Atlas Centaur	ESMC	Intelsat communications.
October 27	RCA-E	Delta	ESMC	RCA communications.
November 11	SBS-C/Anik-C	STS-5	KSC	Satellite Business Systems/ Canada communications.

*ESMC - Eastern Space and Missile Center, Cape Canaveral, Fla.

**KSC - Kennedy Space Center, Fla.

***WSMC - Western Space and Missile Center, Vandenberg Air Force Base, Calif.

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